A GENERAL

TREATISE

OF

Husbandry and *Gardening.*

CONTAINING

Such Observations and Experiments as are New and Useful for the Improvement of Land.

WITH

An Account of such extraordinary Inventions, and natural Productions, as may help the Ingenious in their Studies, and promote universal Learning.

With Variety of curious CUTTS.

For the Months of AUGUST *and* SEPTEMBER, *And the remaining Part of the* Second Year.

By RICHARD BRADLEY,
Fellow of the Royal Society.

LONDON:
Printed for T. WOODWARD, *at the* Half-Moon *against St.* Dunstan's *Church,* Fleet-Street; *and* J. PEELE, *at* Locke's Head *in* Pater-Noster-Row. 1724.


BRITISH MUSEUM
15
60
JUN

To the Right Honourable the

Earl of BURLINGTON.

My LORD,

TO obſerve the Elegancy of Stile in Your Lordſhip's Palaces and Gardens, gives us ſuch an Example of Your diſtinguiſhing Genius, that at the ſame Time I am naturally led to Complement Your Lordſhip upon the Happineſs of Your Taſte, and congratulate my Country upon the Improvements which muſt neceſſarily accrue to it, from the Opportunity we have of admiring Your Lordſhip's Works.

'Tis from ſuch excellent Examples as Your Lordſhip has given us, that we may hope to ſee both our Buildings and Gardens brought to the higheſt Pitch of Perfection; and thereby

by render the Britiſh Nation the Admiration of Foreigners.

This Papers which I here lay before Your Lordſhip, are calculated for the Uſe and Entertainment of my Country: And as they conſiſt of ſuch Deſigns as are new and practicable for the Improvement of Gardens; I have the more Reaſon to hope they will be favourably receiv'd into Your Lordſhip's Protection, which is the higheſt Ambition of,

May it pleaſe Your Lordſhip,

Your Lordſhip's moſt

Obedient humble Servant.

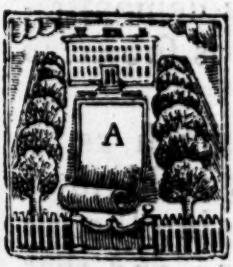
Richard Bradley.

EXPERIMENTS, &c.

IN

Huſbandry and Gardening.

First, *Concerning the Order of Nature, and the Uſe of that Knowledge in the propagating and cultivating of Plants; with Remarks upon the Diſpoſition of Gardens in general.*



AS I deſign this ſhall conclude my Monthly Writings, ſo I think it neceſſary to give my Reader a Word or two particularly concerning them.

When I firſt ſet out in this Way of Writing, I had two Views, the firſt was, to inſtruct the Operators in Husbandry and Gard'ning in the Rational

Part of theſe Arts, by bringing them acquainted with the Nature of Things, and how Bodies, or Parts of created Matter, had a Dependence upon one another: In order to which, I began to explain the Analogy that there is between Plants and Animals, that thereby we might the eaſier know how to enter into that untrodden Path of the Vegetative Life, or how Vegetation is perform'd; which naturally led me to conſider the Anatomy of Plants, and which at length brought me to broach that New Doctrine, that the Sap of Plants circulates as truly as the Blood does in Animal Bodies, which I have in theſe Works confirm'd beyond Contradiction, by many convincing Experiments. At the ſame Time when I conſider'd the State of Plants to be ſo far analogous to that of Animals, I was as naturally led to think that Plants had a Mode of generating, in order to continue their ſeveral Species to the World; and this laſt after much Labour I think I have as clearly demonſtrated, as it is plain that a Plant is ſubject to the Laws of Nature.

Secondly, I endeavour'd, as much as in me lay, to render the Buſineſs of Huſbandry and Gard'ning eaſy and intelligible to all Lovers of thoſe Studies; and that they might take the greater Delight in thoſe Works, I have ſpar'd no Pains to make thoſe Diverſions uſeful and profitable;

ble; and I flatter my ſelf that the Deſign of my Writing has had that good Effect, as to encourage the making many very conſiderable Plantations, which otherwiſe would not have been thought of, and ſo far I hope I may be ſaid to have done ſome Good to the Publick: And I hope the Method which I have propos'd for ſtoring a Garden at once with bearing Fruit-Trees, will afford ſome Pleaſure as well as Profit to thoſe Gentlemen who do not think of planting their Gardens 'till they have Occaſion to retire to them, and uſe them, and ſo are generally forced to wait four or five Years for Fruit; but the Way I propoſe, will immediately furniſh them.

But give me leave to ſpeak a little more fully to my firſt Deſign, *i. e.* of the rational Part of Gard'ning, and how neceſſary it is to conſult Nature in other Things as well as Vegetables. If we would truly underſtand the Nature of Plants, for to judge of a Plant only by the Outſide, will only inform us that it has Roots, Wood, Bark, Pith, Buds, Leaves, Flowers, and Fruit; but for what Uſe theſe ſeveral Parts are deſign'd by Nature, can only be found out by examining other natural Bodies, and conſulting how far one is analogous to the other; and ſo by Compariſon be brought to ſuch Judgment as leads us to Experiments, and thoſe Experiments

declare how far we are right or wrong in our Judgment. We ſhould know alſo how far every Element is concern'd in the Welfare of a Plant; and when we have gone ſo far, we are next to think of the Parts of a Plant, and how far they each of them agree with the Parts in Animals, which we know the Uſe of; and then, when we have diſcover'd how far the Parts of one and the other are agreeable, we are naturally brought to the Diſcovery of their Uſes, *viz.* what Parts are appointed to receive the Nouriſhment, ſuch as the Roots, which do the Office of the Mouths in Animals; the Veſſels or Channels which convey the Juices thro'-out the Body, as the Arteries and Veins in Animals; and ſuch Parts as are made for the Secretion of the Juices, like the ſecretory Ducts in Animals, *&c.* but then ſay ſome, tho' there is a Circulation of Juices in Animals, that is ſet on Foot by the Motion of the Heart, yet there is no ſuch Pump as the Heart in Plants, and therefore there can be no Circulation of Juices: Well then, there are Muſcular Parts in Animals, but there are no ſuch Parts in Plants, nor are the Nerves in Plants, nor Eyes, nor Ears. Let us then conſider why Plants are agreeable to Animals in ſome Things, and not in all. In Anſwer to which, we muſt conſider that Animals have local Motion, and Plants have

have not; therefore all the Parts that are neceſſary to convey Animals only from Place to Place, would be unneceſſary to Plants, which are doom'd by Nature to ſtand always in the ſame Place. Now, as Animals are ſometimes in cold Places, and ſometimes in hot, ſo the Heart is neceſſary to keep their Juices in Motion. The Muſcular Parts and Tendons are neceſſary to give them Strength in their Motion, and their Nerves to give them the Senſe of Feeling; their Eyes to guide them on their Way, and their Ears as well to forewarn them of approaching Danger, as to receive the Word of Command from their Maſters; but every one will certainly allow that a Plant can have no Occaſion for theſe Parts, for the Reaſon given before; The Motion of the Juices in a Plant is carry'd on by other Powers, ſuch as Rarifaction and Condenſation of the Air, as in ſome of my Works I have ſhewn, and this particularly depends upon the Knowledge of the four Elements, and their Powers.

In this Place I cannot help taking Notice of the extraordinary Wiſdom of the Creator, and how much his Omniſcience is to be admir'd in the Contrivance of the Six Days Work, as *Moſes* has deliver'd it to us. If we conſider the Order that the ſeveral created Bodies were made in, we ſhall find, from the Knowledge we

have now of Things, that the ſeveral Bodies could not have ſubſiſted if they had not been created in the very ſame Order that *Moſes* has deliver'd to us; ſo great a Philoſopher was *Moſes*, (if he was not inſpir'd) that I cannot find how his Account of the Creation can be mended, any more than contradicted. I ſhall beg my Readers Patience therefore, while we examine it, and reaſon a little upon it.

We are firſt to conſider the *Chaos* out of which the World was made, as a confuſed Heap of Matter, without Form, being nothing but a deep miry Abyſs, cover'd with Waters, and invellop'd in Darkneſs; however, this Maſs, as confuſed as it was, contain'd a vaſt Capability of Things, which only wanted to be determin'd and ſettled by an omniſcient and omnipotent Power, by whoſe Wiſdom, the ſeveral rich Qualities which lay hidden and confounded with one another, were ſeparated, proportion'd, and ranged in Order, as related in the Six Days Works.

The Firſt Day, The Light was ſeparated from the Darkneſs.

The Second Day, The Firmament was made, to ſeparate the Waters from the Waters.

The

The Third Day, The Waters under the Firmament were gather'd together in one Place, and the dry Land appear'd; the Earth then brought forth Graſs and Herb yielding Seed, and the Fruit-Tree yielding Fruit after his Kind, whoſe Seed was in it ſelf.

The Fourth Day, The Sun and Moon were made to rule the Day and the Night, and to divide the one from the other, and for Signs, and for Seaſons, and for Days, and for Years; and alſo in this Day's Work the Stars were made.

The Fifth Day, The Fiſhes were created, to be Inhabitants of the Waters, and to increaſe and multiply abundantly there, and likewiſe every winged Fowl after his Kind, to multiply in the Earth.

The Sixth Day, Were made every Beaſt of the Earth after his Kind, and Cattle after their Kind, and every Thing that creepeth upon the Earth after his Kind, and laſt of all Man was created to have Dominion over the Fiſh of the Sea, and over the Fowl of the Air, and over every Thing that moveth upon the Face of the

Earth; and God gave him likewiſe every Herb bearing Seed, and every Tree in the which is the Fruit of a Tree yielding Seed.

Thus the Heavens and Earth were finiſh'd, and all the Ornaments of them, as Trees, Flowers, Herbs, Sun, Moon, and Stars, Fiſhes, Fowl, Beaſts of the Field, and every creeping Thing, and at laſt Mankind, the chief of all.

But let us now enquire how neceſſary it is that this Order, and no other, ſhould be kept in the Creation of Things. Would it have been rational to have found the Beaſts of the Field before the Graſs of the Field, or the Fowls of the Air before the Herb with its Seed, or before there were Fiſh, which is the chief Food of ſome Fowls, and even of ſome Quadrupeds? or could there be Herb or Graſs without the Land had been ſeparated from the Waters? or could there be Fiſh without the Waters had been diſtinguiſh'd from the Land? or could the Plants have ſubſiſted unleſs the Waters had been ſeparated from the Waters, one Part to be above the Firmament, to fall in due Time in refreſhing Showers for the Nouriſhment of Plants? or could any of theſe have ſubſiſted without a Body of Air made ſeparate from the other Elements? as ſuch was the Firmament, which kept the Waters which compoſed

compoſed the Clouds, from falling all at once upon the Earth. And beſides, What Poſſibility could there be of any living Creature's finding its Food in ſolemn Darkneſs, or even of moving from Place to Place, without Hazard or Deſpair? or when they had ſeen the Neceſſaries for the Maintenance of their Life, how ſhould they know how and when to ſhift their Quarters in ſearch of their Food, without the Diſtinction of Seaſons, which are regulated by the Courſe of the Sun and Moon, whoſe Influence we find governs the Flights of Birds, as the Stork, the Woodcock, *&c.* from one Country to another, as ſure as the appointed Seaſon is felt by them. Nor are the Fiſh leſs ſenſible of the Times when they are to have their Rendezvous at certain Places, as we obſerve in the Paſſage of Mackarel, Herrings, *&c.* and Plants likewiſe, of ſeveral Kinds, are ſo directed by theſe great Powers, that we find them earlier or later in their Appearance, according as the Sun influences them more or leſs. But if it be objected, that Plants muſt of Neceſſity have the Appearance of the Sun to preſerve them, Experience will prove the contrary; for Plants of any particular Climate, will live in the ſame Climate without the Preſence of the Sun. Nor can I think, as ſome do, that Animals were not originally made to prey upon one another; for if that had not been the

firſt Deſign: If the World had remain'd in a State of Innocence, the Increaſe of Animals would have been ſo great and numerous, that the Earth and Waters could not have contain'd them; nor does the Wiſdom of the Creator appear leſs in the appointing the vaſt Variety of Herbs and Plants upon the Earth, diſtinctly different in their Figures, and in their Natures; for as he ordain'd ſo great a Variety of Fiſh, Fowls, Beaſts, and Inſects, or creeping Things of different Forms, and different Natures; 'tis as neceſſary to ſuppoſe their ſeveral Foods ſhould likewiſe be of different Natures from one another; nay, it is apparently true from Obſervation, in ſuch as diet upon Plants only; the Goat will eat Herbs which are poiſonous to other Creatures, as well as others will eat thoſe which are diſagreeable to the Goat; the Green-Bird will eat the Seeds of the Mezereon, which would poiſon a Man, was he to eat half ſo many as one of thoſe Birds will do at one Time. The different Forms of Plants were likewiſe neceſſary, that every Animal might rightly diſtinguiſh its proper Food from the reſt: And every Inſect too was no leſs regarded in the Creation; for as all Inſects feed upon Plants, it is neceſſary likewiſe that the Figures of Plants ſhould be different from one another, to be diſtinguiſh'd by them; and ſo the Inſects too, were neceſſarily diſtin-

diſtinguiſh'd from one another, as they were to ſerve as Food for young Birds, being tender and eaſy of Digeſtion, before their Crops or Maws are capable of digeſting Grain or Seed; but when the Birds were created perfect, they had no need of theſe Inſects to feed upon; ſo that the Creation of Inſects was not neceſſary till the laſt Day's Work, which we ſuppoſe was before there were Increaſe of Birds to require them for Food. Nor do I think the Waters are leſs productive of Varieties of Plants than the Land: What numerous Diverſities may we obſerve even upon the Sea Shores; and what Plants of curious Figures do we meet with in Rivers and Lakes, which ſerve for the Food and Shelter of Fiſh; and as Plants were the only created Bodies that are wanting of local Motion, how wiſe is the Deſign of placing their Seed in themſelves; for how elſe could they increaſe? For if we take a Survey of all the other created Works upon Earth, we find they are endow'd with local Motion, and that the coupling of the Male with the Female is neceſſary, in in order to increaſe or multiply their Species; but theſe can follow one another from Place to Place, the Male to find out the Female, or the Female to diſcover the Male; but Plants are fix'd and confin'd; therefore, unleſs they had in themſelves the Male and Female Powers, we could not

not expect their Continuance; and it is likely that from this Paſſage in *Moſes* writings, came the firſt Thought of Plants having a Power of generating, tho' it was not underſtood by what Means, nor was the Explaination of it attempted by any that I know of, 'till I firſt made Experiments upon it in *Holland*, which when I found to anſwer my Expectation, ſerv'd very much to improve the Diſcovery of the Sap's Motion. But as Plants are made of different Forms, and have different Virtues, as well as Animals and Inſects differ from one another; how neceſſary is it that they ſhould be made Inhabitants of different Climates; therefore, with what Wiſdom was the Sun's Courſe directed as it is at preſent, to regulate the Climates to the Service of all the ſeveral Kinds; but there is no End of admiring the Beauty and Order of this excellent Work, which is ſo wiſely diſpos'd, to contain every Thing neceſſary, and is ſo ſubject to Order, that no ſtrictly new Species can be produc'd, or can any different Creatures whoſe Parts and Nature are near enough the ſame to couple with one another, bring forth a Body which ſhall have Power to increaſe or multiply.

Before I leave this Subject, I think it *apropos* enough to give my Reader a Word or two concerning Creation, as I find it in Dr. *More*'s *Conjectura Cabaliſtica*. In the Philo-

Philoſophick Cabala Chapter 2d, the Doctor reaſons thus, That thoſe Things which in his Literal Cabala he calls the Garniſhing of the Heaven and the Earth, namely, the Sun, Moon, Stars, Animals, Vegetables, *&c.* in his Philoſophical Conſtruction, he ſays, They are not only ſo, but the Generations of them; he ſays, Plants and Animals were the Generations, Effects, and Productions of the Earth, the Seminal Forms and Souls of Animals, inſinuating themſelves into the prepared Matter thereof; and Suns, Planets, or Earths were the Generations or Productions of the Heavens, Vigour and Motion being imparted from the World of Life to the immenſe Body of the Univerſe. So that what he before, in his *Literal Cabala*, call'd mere Garniſhings, he now ſays, are indeed the Productions or Generations of the Heavens and of the Earth. So ſoon as they were made, (he goes on) That he does not take upon him to define the Time wherein God made the Heavens and the Earth; for he might do it at once, by his abſolute Omnipotency; or he might, when he had created all Subſtance, as well material as immaterial, let them act one upon the other, ſo, and in ſuch Periods of Time, as the Nature of the Production of the Things themſelves requir'd. Thus far the Doctor's Philoſophical Reaſoning how the Creation of Things was brought to paſs: I

ſhall

ſhall proceed to offer ſome Particulars relating to the deſigning and laying out of Gardens; wherein I ſhall endeavour to ſhew, that the more agreeable to Nature our Gardens are made, ſo much more Beauty do they contain, and come nearer that elegant and polite Taſte which at preſent is wanting in Gardens.

Now we have taken this ſhort View of Nature and its Order, we may judge how ſhocking and deteſtable muſt every Thing be, that is contrary to it; its Beauty is Freedom, and its Gaiety familiar; and nothing can be agreeable to the Mind, that is not concordant with it. Thoſe who make the deſigning and laying out of Gardens their Buſineſs, ſhould chiefly conſider this, and alſo inform themſelves that Nature is full of Variety, and that it is the great Variety in Nature that captivates the Mind, and draws Admiration, and eſpecially that the more Variety there is in a Garden, ſo much the more it reſembles Nature, and of Conſequence is the more beautiful and pleaſing; for good Judges will judge of Gardens as they do of Pictures, the more free and lively Expreſſion is always preferr'd before the more ſtiff and formal. In the Diſpoſition of a Garden, there ſhould always be avoided the too ſtiff Regularity, as well as the too wild and extravagant; an eaſy and familiar Diſtribution of Art and Nature, of Rule and Liberty,

berty, will always beſt recreate the Mind; nor ſhould the Proportion of the Works in a Garden be leſs conſulted; for they may be too much crouded, as well as too thinly diſpers'd, and either of theſe is alike ſhocking to the Senſes, and argues Want of Taſte and Judgment in the Contriver; ſo is it alike diſagreeable, to ſee Works of the higheſt Grandeur, which ought only to appear in Gardens of the greateſt Extent, attempted in a ſmall Garden; for tho' on a large Plan they may have a good Effect, when they are judiciouſly intermix'd with one another, yet take any one of them ſingly, and confine it to a ſmall Ground, it will loſe its Beauty. It is no leſs diſagreeable to command the Proſpect of a Garden all at once; and that generally happens from the Love our Deſigners have for diſpoſing of Gardens in regular Figures, and from their ſtudy'd Contrivance of making one Part uniform with the other; and then 'tis no Matter what the Expence may be, but the Ground muſt be levell'd. Indeed, I cannot ſay but ſuch a Regularity looks very well in a Draught; but when it comes to be work'd, the Sight of it ſtupifies and dulls the Senſes as bad as the conſtant Noiſe of aMill, or turning round for half an Hour would do: And beſides, this ſtudy'd Regularity has another bad Conſequence, and that is, all Trees, however ſtately they be, that happen to ſtand

ſtand upon the appointed Ground, muſt be taken away, to give Place to this ſolemn Stiffneſs. I ſhould not be ſo very particular on this Head, if I could find a Garden without ſome Fault or other of this Kind, for then there would be an Example which might ſave me this Trouble: However, I am not to be underſtood that we have no Gardens in *England* that are agreeable, for we have many that have their Beauties as well as their Faults: But I mean, there is not one that carries the good Taſte quite through; which perhaps may happen from the Deſigns of them being made by Men of different Genius: We ſhall in one Part ſee ſomething of a becoming Grandeur, well diſpos'd and adapted to the Extent and Deſign of the Place; and on the other Hand we obſerve ſomething as mean and poor ſpirited, and diſproportionable; narrow Walks of a Mile in Length, and wide Walks and Views of a hundred Feet in Length; and one Thing more is as frequently to be obſerv'd, and is no leſs improper, that is, in the diſpoſing of Pots of curious Exoticks, when they are ſet abroad in the Summer Seaſon; many of the Alloes, Fecoides, Sedums, *&c.* which never make large Plants, and whoſe Beauties will bear the niceſt Examination, are often ſet on the Ground, by the Side of a Verge of Graſs, or Gravel, perhaps ten or twenty Feet Diſtance from one another;

ſo

ſo that the Deſign of them is loſt, and they make no Appearance worthy our Regard; and this Diſpoſition is probably one Reaſon, why thoſe Curioſities are not more frequently propagated: For to what End is any Thing brought into a Garden, unleſs it is made agreeable to ſome of the Senſes; ſo Auriculas, Carnations, and other curious Pot Flowers, tho' they are never ſo fine in their Kind, may be diſtributed in a Garden with ſo little Judgment, as never to command the leaſt Admiration; but when they are ſet together on Benches or Stands, the Variety and Mixture of their Colours leads us to admire them, and they then make a good Part of the Ornament of a Garden; if it be ſmall, ſuch Stands of Plants may very properly terminate the Walks.

It is likely that theſe Miſtakes may proceed from four Things.

Firſt, From the natural Genius of the Deſigner, which perhaps is low and mean, and not daring enough to ſtudy Grandeur; or,

Secondly, From the Want of Opportunity of obſerving thoſe Things, which are great and noble, both at Home and in other Countries; or,

Thirdly, From the Want of converſing with Men of Taſt and good Judgment; or,

Fourthly,

Fourthly, From the Want of Conduct, to apply properly the ſeveral Materials he has got together. Neither do I think, that when he is poſſeſs'd of all theſe Neceſſaries, to make a good Deſigner, he can ever render his Draught upon Paper intelligible enough, to give us thoſe Ideas, which we ought to have of a Garden before it is made; for tho' indeed it is true, that by ſhading of a Draught, one may in ſome Sort repreſent Hollows, Slopes, Terraſſes, *&c.* ſo that the Workmen may underſtand how to work from it; yet the Gentleman for whom it is made, can never rightly frame an Idea from ſuch a Draught, of what it will be, and how it will appear when it comes to be finiſh'd: Therefore in ſuch a Caſe, I would always adviſe a Model to be made of every Garden, before it ſhould be determin'd entirely, whether it ſhould be made or not; for in a Model, we may obſerve the Riſings and Sinkings of the Ground, the Terraſſes, the Hedges, and every other Part as it will appear to the Eye; when it is made, we ſhall diſcover by fixing ſome Point at a little Diſtance from the Model, what Parts may be ſeen at one View; and then, by ſhifting the Point, diſcover other Objects which were not diſcover'd to us before; and ſo if by ſhifting our Points round about the Model, keeping the Eye always to the ſame Height,

Height, we find new and entertaining Objects from every Point, then one may allow ~~such a~~ Design to be good; and beſides, as ſuch a Model will be made by a Scale, and every Part of the Ground, as well as every Hedge, or Plant, or Urn, Statue, or Water Work, *&c.* will be of its intended Proportion; ſo whatever offends the Eye in the Model, muſt neceſſarily offend in the Work itſelf; but a Draught will not Diſcover either the Beauties or the Faults; and really conſidering how cheap a Model might be made of a Garden, and how much Money it might ſave a Gentleman in Alterations; beſides, its Beauty which might render it as agreeable as a Picture in an Houſe, after we had made the proper Uſe of it; I wonder no Body has yet had Models of Gardens made; if it is becauſe it has not been yet thought on, or becauſe it is not known where ſuch Things can be made; I ſhall inform my Reader, that I have inſtructed one in the Method of making them, and embelliſhing them in a proper Manner; who may be heard off at Mr. *Fairchild*'s at *Hoxton:* But eſpecially the moſt beautiful Gardens, may be made where the Ground is the moſt irregular and uneven, where there are Hills and Pits; theſe unlevel Spots dictate to Men of Taſte thoſe Varieties, which by diſcreet Management, will afford the greateſt

Beauties in a Garden, and by no Means ſhould be level'd, unleſs ſome Part near the Houſe. Where ſuch Ground as this is not met with, it is impoſſible to have any juſt Idea of the Beauties it may produce without a Model. What an extraordinary Effect has the Irregularity of the Ground in Mr. *Blathwait*'s Gardens near the *Bath*; and how much has the Gravel-Pit been admir'd in *Kenſington* Gardens, and ſo in every Place where the Hills and Hollows are order'd with Judgment, they always have an extraordinary Effect. In ſuch Places, if there happens to be the Command of Water, and the Work is larger, it ſhould be diſpos'd *a la Ruſtica*; and upon the higher Parts which are moſt remote from the Houſe, ſhould be plac'd Obeliſks; and if a Summer-Houſe be requir'd, let the Foundation of it and ground Room be ruſtick Work, in Imitation of a Rock, and the Chamber above be built in the Manner of a *Grecian* Temple, which would have an extraordinary Effect: All this diſpos'd in Wilderneſs or Boſquette-Work, which ſhould have here and there ſome open Places, where ſome of the Fables of *Æſop*, may be repreſented by Beaſts and Birds, as big as the Life caſt in Lead, and painted of their natural Colours; and if there is Conveniency, let them play Water at one another; alſo where Water may be commanded,

manded, it may be us'd to give Motion to Figures, which will ſtill contribute to entertain. This Boſquette-Work, ſhould likewiſe be interplanted with all Sorts of wild Wood-Flowers, as Primroſes, Cowſlips, Harebells, *&c.* which will extreamly add to its Beauty. In ſhort, whatever ſeems the moſt natural, or poſſeſſes more of natural Beauties, is the grand Taſte; and whatever poſſeſſes, formal Regularity generally carries a Stiffneſs along with it, which is the Mechanical Taſte. I own that the Thought of introducing in this Wilderneſs Work, ſome of the Fables of *Æſop*, which chiefly are repreſented by Birds and Beaſts, I took from the *Verſailles* Gardens, where even tho' the Ground is level, they have an extraordinary Effect; but in ſuch a Ground as I have been ſpeaking off, they will have a much better Appearance, as in its own Nature it is more rural: In ſuch Places too the Thoughts are more given to Contemplation, and ſuch Moral Pieces as the Fables of *Æſop*, may give us Opportunity of improving our Tallent that Way, as the beautiful Appearance of natural Things, may lead us to admire the Wiſdom of the Creator. A very ingenious Gentleman, whoſe Taſt in theſe Matters, is much the beſt I have met with, gave me the Hint of placing Obeli...s in ſuch Gardens; for as he obſerves, good Statues

are hard to come by, and a ſingle Statue here and there has ſo poor an Appearance, that we had better have none at all; but as grand Gardens cannot be quite void of Ornaments of this Nature; this Gentleman adviſes the erecting of Obeliſks, which he would have dedicated to great Men, who have done Service to their Country, by fixing Inſcriptions upon the Pedeſtals of each Obeliſk; and *en paſſant* I muſt take Notice too of a concurring Remark, which another curious Gentleman made upon this Deſign, when I told him of it; that he thought, there ſhould likewiſe be ſome Obeliſks put up in Memory of ſuch Perſons, who had wrong'd or abus'd their Country; but whether this be or be not put in Practice, it is ſure, nothing can have a finer Effect in ſuch Work as I have been ſpeaking off, than theſe Obeliſks.

But from this Grandeur of Deſign in Imitation of Nature, we muſt contrive to come nearer artful Regularity; as we come nearer the Houſe, and that muſt be done gradually, and not too ſuddenly, for too ſudden Breaks from one Thing to another, are ſhocking, and eſpecially when the Difference is ſo great, as between natural Freedom and formal Rule; therefore when we leave the Wilderneſs we have been ſpeaking off, we may terminate ſome of its Walks next the *Parterre* or *Area*, which ſhould be always next the Houſe, with

with Portico's, or Triumphal Arches in Latice-Work, or as the French call it *Treiliage*; which Works being painted with a verdegris Green, and gilt in the principal Parts, have a very good Appearance. The Regularity of theſe Works, and the natural Order of the Forreſt Plants, which ſhew themſelves beyond them from the Houſe, make a very agreeable Proſpect. I had omitted to mention, that in the Diſpoſition of our Boſquette we ſhould chooſe ſome hollow Part to place our Orange-Trees in, ſo that the Walks or Places the Trees are to ſtand upon, may move gently downwards in the Manner of a Screw; and eſpecially taking Care to leave Walks about the whole, and above the Trees, ſo as to look down upon their Heads, for then we obſerve all their Beauties; but this by the by; let us return to that Part of the Garden, where we leave the grand Part to gain gently; the *Parterre*, ſuppoſe at the ſame Diſtance from the Houſe, where we place the Portico's of Latice-Work; over againſt the Middle of the Houſe, we erect ſomething with Yews or other Ever-greens, in the Form of an Amphitheatre, and place a Line of Statues upon Pedeſtals. If we can have them good to ſtand Parallel with the Line, on which the Portico's and Amphitheatre is plac'd. In the Boſom of the Amphitheatre, may now be a

regular Baſſon with a Jet; and within the Line of Statues towards the Houſe, one may contrive a little Wilderneſs Work to be bound with low ever-green Hedges, and include only the ſmaller or moſt dwarf flowering Shrubs: This will make the Break from Nature to Art the more eaſy; till now next the Houſe, we have a Piece of Ground more apparently regular and adorn'd with Ever-greens, Urns gilt, or otherwiſe, *China* Jars, and ſuch like, which is the Beauty of the *Dutch* Gardens. The Regularity in this Part, if it is not crouded, is not amiſs, becauſe it joyns with a Building which ought to be regular; and beſides, as the bounds of this Area or *Parterre*, ſhould be no more than what may all lye under the Eye, from the grand Appartments of the Houſe, it ſhould have Symetry and Order in it; but eſpecially, it ſhould not be confin'd by any Walls, if poſſible, or at leaſt, the Walls ſhould be hidden by ſome Means or other. I ſhould eſteem it likewiſe, one of the greateſt Faults, to fence in the grander Part of the Work with high Walls; for all Occaſion ſhould be taken, to make ſuch Works appear without End; of which, the Gardens of *Verſailles* are a very fine Example: But tho' it is impoſſible, that any one leſs than a Prime Monarch, could ever be Maſter of ſo great and noble a Deſign as *Verſailles*;

ſailles; yet from thence, a Man of true Taſte, may extreamly improve his Genius, and render many of its Beauties conformable to ſmaller Deſigns, as well as it would quite confound and deſtroy one of no Taſte, or of an indifferent Genius. As for fine Fruit, it is by no Means proper in ſuch a Garden as I ſpeak off; that ſhould always have its Station in the Kitchen Garden; nor would I have my Reader after peruſing the Conjectures above, believe that there is not a Poſſibility of making an elegant Garden, under an hundred Acres, for the grand Gouſt, may be as well ſhewn in a ſingle Acre, as in a thouſand; as ſure as the Gentleman will always ſhine, let his Circumſtances be never ſo narrow.

Deſcription of a Mill for making Cyder, with twelve Buſhels of Apples to each Hogſhead. Invented by Edmond Browne *of* Rodborough, *Eſq; in* Glouceſterſhire; *and now in Practice among the Inhabitants of that Part of the County.*

I Need ſay very little in Commendation of the above-mention'd curious Gentleman's Invention, for making an Hogſhead of Cyder with twelve Buſhels of Apples,

ſince it is ſo well known, that the Common Allowance of Apples for an Hogſhead, is twenty, and ſometimes two and twenty Buſhels; ſo that by this Method, there is at leaſt, one third Part gain'd upon all the Cyder-Ground in *England*; which vaſt Improvement, very juſtly demands the Thanks of every true Lover of his Country, to the worthy Inventor.

Explaination of the Mill for Grinding Apples.

Fig. I. Repreſents the Binn or Trough whereinto the Apples are pour'd, in Order to their being tumbl'd down between the Rollers to be ground. This Binn is furniſh'd with a Tongue *a* that enters into the Box. *Fig.* II. The better to guide the Apples to the Rollers, and the Tongue is lodg'd upon a Reſt, plac'd within at the Mouth of the Box, in ſuch a Manner, as that the End of it may hang directly over the Top of the Roller *b*, *Fig.* IV. but ſo as not to touch it; the Perſon that grinds at the Handle *e* of the Mill, *Fig.* IV. is with his left Hand to feed the Mill, and govern the Apples that they may tumble into the Rollers, in a juſt Proportion and not choak.

Fig. II. Is a Box to be faſt'ned down (by its Frame *A*) with Screws or Keys upon the Pieces *b* and *i* of the Mill, *Fig.* IV.

to

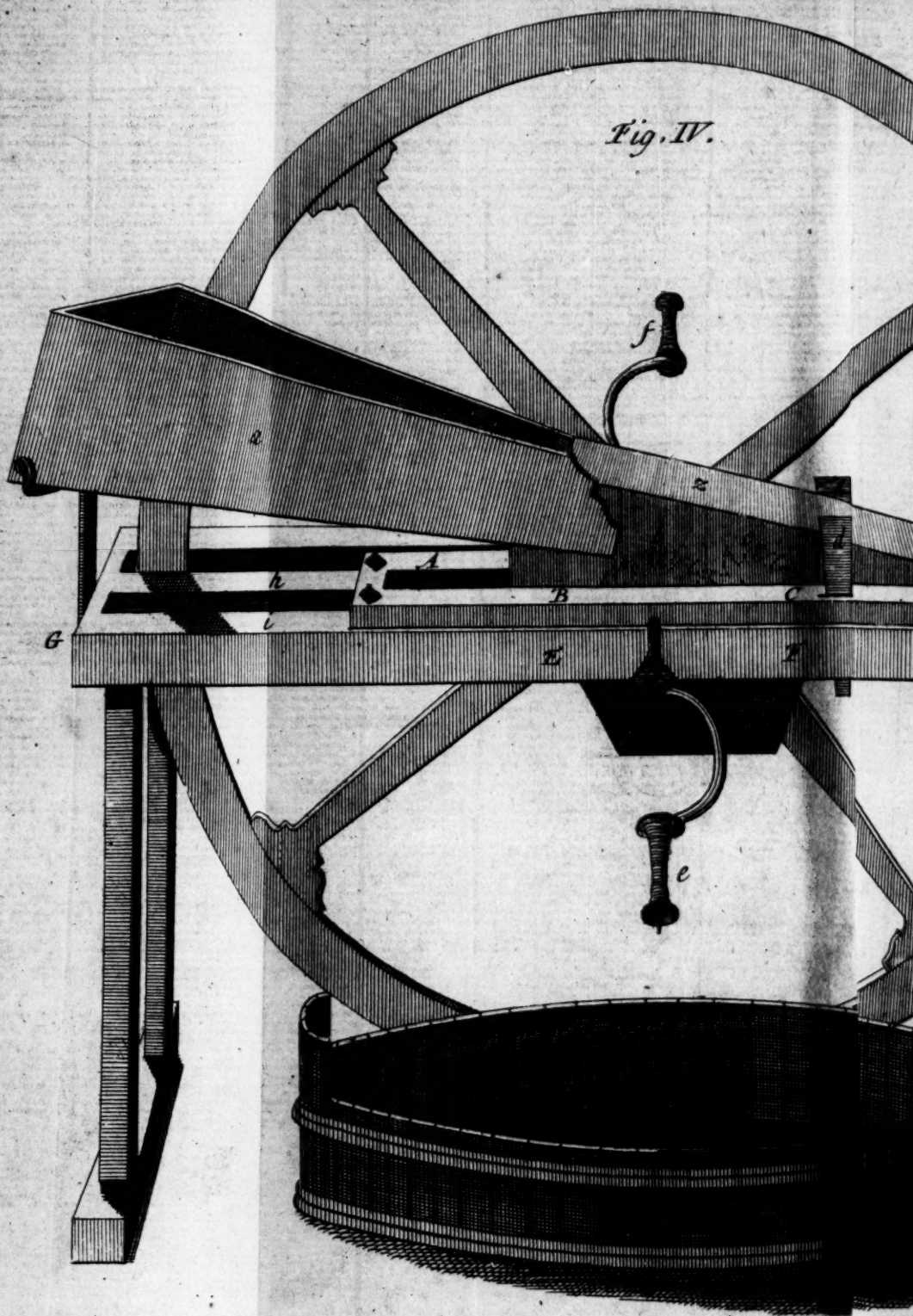


Fig. IV.
f
A
h
i
B
C
G
E
F
e

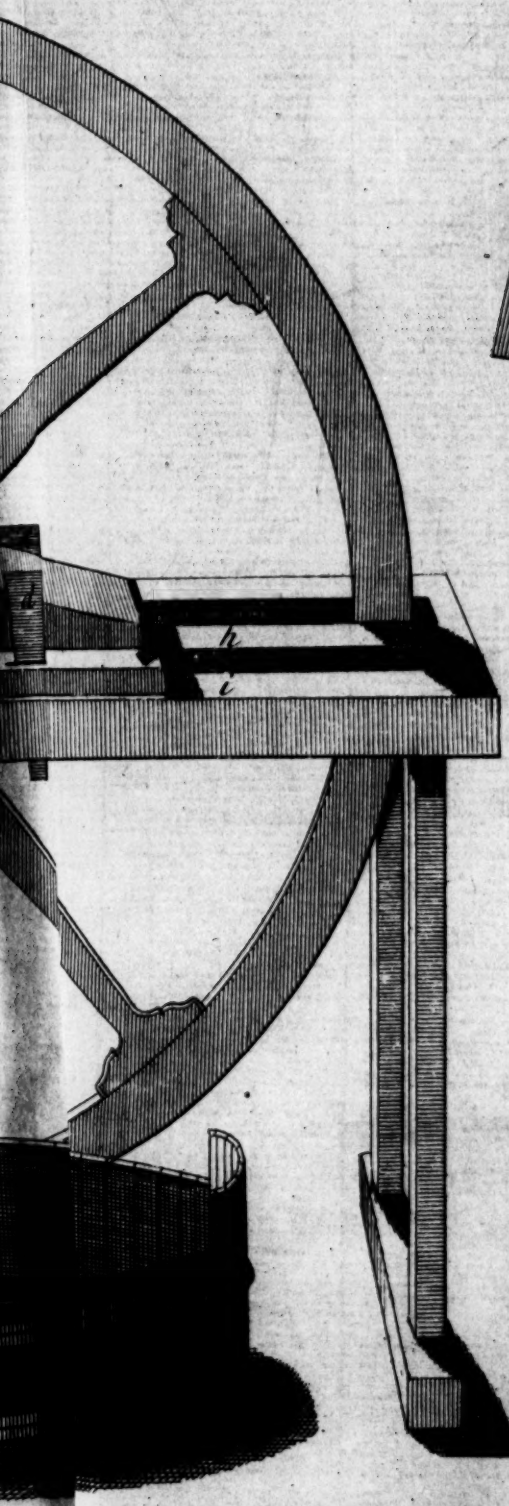


Fig. I.

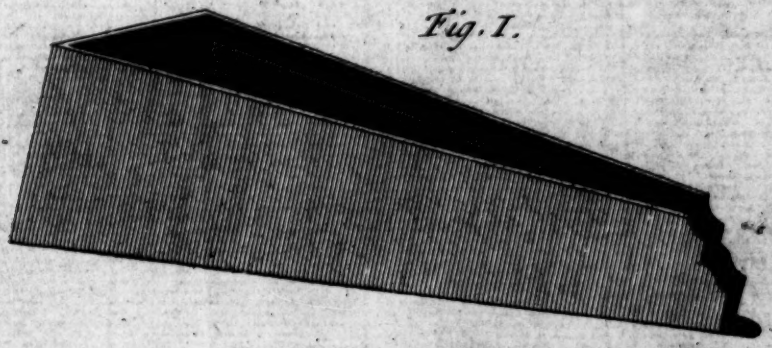


Fig. II.

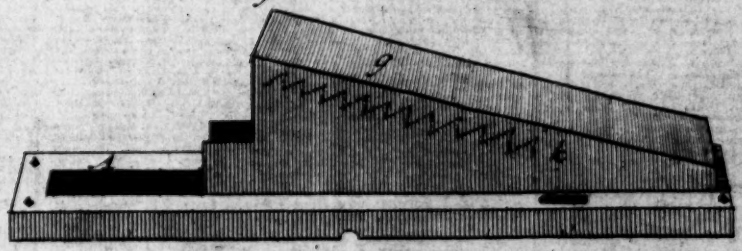
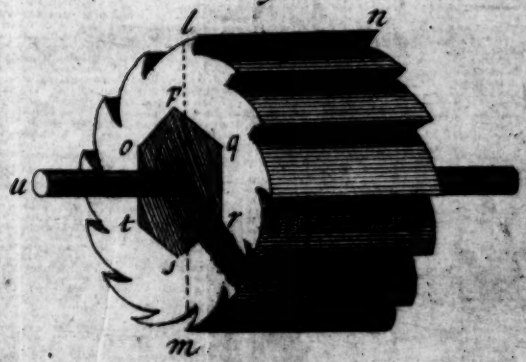


Fig. III.



J. Clark sculp. 1723

to protect the Rollers, and confine the Apples. The Top Board of this Box *g*, is to be furniſh'd on the Inſide with Teeth or Furroughs, repreſented by the prick'd Indentings *k k*. The Uſe of theſe Furroughs, is to cruſh a larger ſiz'd Apple (at its Entrance) againſt the Roller *b*, *Fig.* IV. that it may not refuſe to be taken in between the Rollers *b* and *c*. This Top Board ſhould therefore be elevated, to ſuch an Angle with the Frame of the Box, as that it may be at a proper Heighth from the Roller *b*; and alſo ſo near to the Roller *c*, as juſt not to touch it; thereby to prevent any Parts of the Apples, from getting over and beyond the Roller *c*.

Fig. III. Repreſents a Roller drawn to a larger Scale, (with 13 Teeth) the Diameter *l m* is 7 Inches, the Thickneſs *l n* 4 Inches ½. The whole being of caſt Braſs or Bell-Metal, except a Cavity thro' it, repreſented by the hexagonal Figure *o, p, q, r, ſ, t.* and which is fill'd up with Wood, wherein the Iron Axis *u u* is plac'd. The angular Figure of this Wood, prevents its looſening or turning round within the Metal.

Fig. IV. Is the Mill join'd in all its Parts; wherein *a* is the Binn, ſupported behind by a Reſt *w*; *z* is the Box ſcrew'd on by its Frame *A*, to the Pieces *b* and *i*: If you ſuppoſe the Side of this Box tranſparent, the Rollers

Rollers *b* and *c*, which are of equal Bigneſs, and repreſented by dotted Lines, will be ſeen thro' it. The Roller *b*, turn'd by the main Axis whereon the Wheel hangs, drives the Roller *c*, which runs in Braſs Collars, lodg'd in little Blocks of Wood, moveable to and fro, in hollow Mortices or Channels made on Purpoſe in the Pieces *h* and *i*. The Deſign of placing this Roller on theſe moveable Blocks, is to give it Liberty to recede more or leſs, as there is Occaſion, from the Roller *b*. The Quantity of this Receſs is adjuſted by the Wedges *d d*, which paſs thro' Mortices made for them, and whoſe Sides are contiguous to the Ends of theſe Blocks. Whilſt the Apples are whole we give the Rollers the more Liberty, by raiſing theſe Wedges; but when we grind 'em over again the ſecond Time, after the firſt preſſing, we confine the Rollers more, by forcing the Wedges down. The Rollers are to be plac'd, as that, when they have the moſt Liberty, they may but juſt run free between the Pieces *h* and *i*, and the Sides of the Frame of the Box, and two croſs Bits of Wood lodg'd and faſt'ned in the Inſide of the ſame Frame, about the Place *B* and *C*, to the Intent that no big Pieces of Apple may drop through unground. *Y* repreſents a hollow Conveyance, or Mouth, plac'd under the Rollers, to deliver the ground Apples into the Receiver or Tub *x*; the Handle *f*, at which a ſe-

cond

cond Perſon turns, is placed ſo as to be elevated when the other is depreſs'd, that the Force may be the better at all Times equally exerted. The Pieces *b* and *i* being pretty long, it is proper, in order to ſteady 'em, and prevent their ſwerving, to connect them together by croſs Stays, or Bits of Wood about the Places *E* and *F*. The Handles *e* and *f* are hollow wooden Tubes riding on Iron Spikes. The Height of the Frame of the Mill from *G* to the Ground, is about three Feet.

My Method of making Cyder.

After grinding, I ſqueeze my Apples very hard with a ſtrong Screw Preſs, wrought with a Capſtern, in Hair Cloths, reev'd or drawn into the Form of a circular Bag, by means of Strings or Loops, four or five Buſhels at a Time, in as many Bags, with a round Board two Inches thick, put between each Bag. Theſe Boards are made of Inch Plank nail'd together croſs-grain'd. When the Apples are one Time ſqueez'd, I order the Cakes or Cheeſes to be rubbed to Pieces, and ground and preſs'd over again; and if this were to be repeated even a third Time, it would anſwer the Pains, for it would procure Liquor enough to pay the Wages of two Men for a Day; that is to defray the Charges of the Labour of your Cyder making.

making. Twelve Buſhels of Apples heap'd (which is the uſual Way of meaſuring Apples) will by this Method moſt commonly yield more Juice than will fill a Beer Hogſhead: About two Thirds of the Liquor runs out at the firſt preſſing, the remaining Third at the following ones.

An Account of a Warren, and its Profits, from Mr. William Gilbert, *Maſter of the famous Warren now upon* Auborne Chaſe.

Auborne Chaſe, which of long Date has been allow'd to produce the beſt *Rabbits* in *England*, is ſituate in *North Wiltſhire*; the Warren Part was once of vaſt Extent, but is now reduced to about 700 Acres; and tho' the Ground which is now in Warren is commonly judged to be one of the moſt barren Parts of *England*, from the exceeding ſhortneſs and ſmallneſs of its Graſs, yet we are aſſur'd that thoſe Parts which have been plough'd up, of the ſame Kind, at the Reduction of the Warren, produc'd the moſt luxuriant Crops of Corn that has been known to grow in the Kingdom, which happen'd, as is ſuppos'd, from the Soil being render'd fine by the working of the Rabbits, and alſo from the

the large Share of Vegetative Salts, proceeding from the Dung and Urine which by plowing were regularly mix'd, and thereby render'd fruitful.

The Soil is Chalk, partaking a little of a reddiſh ſandy Loam ſomewhat ſtoney, with an hard Rock at the Bottom. The Surface which is hardly more than two Inches in Thickneſs, partakes more of the Loam than of the Chalk; and upon the niceſt Obſervations, I could not find any other Herb growing upon it than Nettles, Ragwort, and Silver-weed, and thoſe only where the Ground had been diſturb'd in ſome Places. I alſo obſerv'd the Elder to thrive very well in this Warren; and I ſuppoſe that many other Kinds of Trees and Herbs might be made to grow there, if they were cultivated, as I ſhall endeavour to prove by and by, from Example.

'Tis remarkable however, that the Rabbits of this Warren, as it is now, are very fat in the dryeſt Summer; and even in the moſt ſevere Winter, their Kidneys can hardly be diſcover'd for the Fat upon them; this laſt I imagine may depend partly upon the Fodder which is given them in the ſevere Seaſon, and when the Snow is on the Ground, as well as upon the Fineneſs of the Graſs they feed upon in the Summer: The Fodder given to the Rabbits in the Winter, beſides the fine

Hay

Hay of that Country, is chiefly the Hazle, whoſe *Bark* they devour very greedily; and as I obſerv'd before, the fine Graſs which they feed upon in the Summer, is very nouriſhing to them, and keeps their Bodies in good Plight, from a Virtue in it which prevents the Rot among them; ſo I ſuppoſe that the fine Hay of that Country, and the Hazle Bark, contribute no leſs to their Welfare, by furniſhing them with Nouriſhment not over abounding with Moiſture: And in the Paſture Grounds about this Warren, which are like it in Soil, it is obſervable, that the Sheep never are ſubject to the Rot in the wetteſt Seaſon; and tho' one could hardly think the Graſs was long enough for their Bite, yet many Cows are kept upon that ſhort Turf, and receive ſo much wholeſome Nouriſhment from it, that their Milk is much richer than that of the Cows in the Vale, where the Graſs is luxuriant, inſomuch that upon Trial, two Gallons of the Milk of the *Aubourn* fed Cattle upon ſhort Graſs, always yields more Cream than three Gallons of Milk of the Cows fed in the Vale upon long Graſs: So that the Cheeſe made from the *Aubourn* Cows, is much richer and fatter than what is made from the Cows of the Vale, as I find by Experience: Indeed, the Cows which feed upon this ſhort Graſs, hardly yield three fourths of the Quantity of Milk that the Cows

Cows of the Vale uſually do; but then the Goodneſs of it is ſo far beyond the other, that if it was but half the Quantity, the Price of the Cheeſe made of ſuch Milk will ſufficiently recompence the Want of Meaſure; but eſpecially if the ſame Method was to be taken here in making the Cheeſe as is uſed at *Stilton*, which is eſteem'd the beſt in *England*; the Receipt of which I have publiſh'd in my Monthly Papers for the Month of *March*, 1721.

From theſe Examples we may conclude, that there is in this Sort of Graſs an excellent rich Quality, which affords an extraordinary Nouriſhment for Cattle, and renders them healthful and wholeſome for our Uſe; for as they are well nouriſh'd, and preſerv'd in Health, by ſuch Food, ſo we may reaſonably judge, that the Fleſh of ſuch Animals, and their Milk likewiſe, which is free from Diſtemper, muſt be nouriſhing to Mankind, who makes 'em ſo great a Part of his Diet.

And now I have done with the Soil, as far as it concerns the Rabbits and their Food, it will be neceſſary to hint that this Warren is wall'd about ſo that they have not the Liberty of ſearching their Food elſewhere; therefore 'tis only what they get in the Warren which brings them to that Perfection, which gives them their ſuperior Value over other Rabbits.

Of the Number of Rabbits neceſſary to Stock a Warren; and of the Value of good Rabbits.

MR. *Gilbert*, who is the preſent Maſter of *Aubourn* Warren, and has all his Life-time been bred up in that Way, tells me, that it is neceſſary always to keep 8000 Rabbits for a Stock, in about 700 Acres of ſuch Ground; and judges, that one Year with another, the Increaſe from ſuch a Stock is about 24000 Rabbits; but theſe are ſubject to many Accidents, by Poachers, by Weezels, Polecats, Foxes, and Diſtempers, tho' the greateſt Care be taken of them by watching, ſetting of Ginns, or in their Food. To view the Warren in its preſent State, one would ſuppoſe that the Food there would hardly maintain half ſo many; but yet we find by his Method of Management, that he loſes few of them, and his Warren is always in better Caſe than others, and his Rabbits of a greater Price; they are known from others by being ſhorter legg'd, and ſhorter body'd, and thicker; and are highly admir'd for the extraordinary Sweetneſs of their Fleſh, which is as far ſuperior to that of other Rabbits, as the Down Mut-

ton

ton excels the Fleſh of the larger Kind of Sheep fed in long Graſs.

The Time when he firſt begins to kill them in Quantity for the *London* Markets, is about *Bartholomew-tide*; and from that Time to *Michaelmas*, delivers them at *London* for nine Shillings *per* Dozen, free of Charges; but from *Michaelmas* to *Chriſtmas* has Ten Shillings and Six-pence for each Dozen, deliver'd in *London*, himſelf being ſtill at the Expence of Carriage, which amounts to Twenty Shillings *per* Hundred, which is Six Score. The Reaſon, he tells me, why the Price of Rabbits is leſs between *Bartholomew-tide* and *Michaelmas*, than between *Michaelmas* and *Chriſtmas*, is, becauſe the Skins are not perfect 'till *Michaelmas*, and then they are not worth above a Penny a-piece, and then the warm Weather will not ſuffer the Rabbits to keep fit for eating above two or three Days; but from *Michaelmas* to *Chriſtmas* the Skins are in Perfection, and are worth near Six-pence a-piece, or about Five Shillings *per* Dozen, and the Weather will ſuffer the Rabbits to keep perfect for four or five Days after killing. This explains to me a Difficulty which otherwiſe I could never have ſurmounted; for it is commonly practis'd in *London*, to ſell the Rabbits without their Skins for Ten-pence or Twelve-pence apiece 'till about *Michaelmas*; and from that Time to *Chriſtmas*,

when the Poulterers paid dearer for them, they have been bought for Eight Pence, and Seven Pence apiece, and even ſometimes for Six Pence; but it appears by this, that 'tis the Value of the Skins, which is the chief Occaſion of the Different Prices.

He acquaints me farther, that when a Skin is in Seaſon, the Wooll or Fur is not all of the ſame Fineneſs, the coarſer Sort is worth perhaps three Pence *per* Pound, the next about five Pence, and the fineſt, which is in the Poll of the Neck, is worth about three times as much; but when the Skin is not in Seaſon, I am told that 'tis ſo hard to ſeparate the little good Wooll from the bad, that the Trouble is almoſt as much worth as the Wooll it ſelf; and therefore it appears, that the Wooll of a Rabbit in Seaſon is worth full as much as the Fleſh of the Rabbit, and we have then Rabbits cheaper in *London*. But in *Hertfordſhire* there is a Warren, where all the Rabbits are of that Kind which have the Silver Hair, as they call it, and their Skins are worth Twelve-pence apiece, when they are perfect: So that for their Skins alone it is worth while to keep 'em, if the Fleſh were thrown away. And one Reaſon why I ſuppoſe the *Auburn* Rabbits may be valu'd in an extraordinary Manner, is becauſe their Wooll is finer than others, from the Nature of their Food, which

will

will contribute to the Fineneſs or Smallneſs, I ſuppoſe, as a barren Land will always produce Plants conſiſting of much ſmaller Parts.

To Dr. BRADLEY, *&c.*

London, Sept. 6, 1723.

Dr. BRADLEY,

THY unweary'd Endeavours to promote Publick Good, deſerves the Thanks and Encouragement of every Lover of his Country, and induces me to contribute my Mite to ſo laudable an Undertaking, being an Obſervation I've lately made. Many good Eſtates and fine Seats that lie on the Sea Coaſts, are render'd very unpleaſant and Incommodious, by their expoſedneſs to the Fury of the Weather: Some Attempts have been made to redreſs this Grievance, chiefly by making Plantations of Trees; yet in many Places this hath not ſucceeded, which I am perſuaded principally proceeds from a wrong Choice of Trees, for ſuch Expoſures. In my Journey along the Sea-Coaſts of *South-Wales*, I obſerv'd the Great Maple, or what's commonly call'd the Sycamore,

more, compleatly to anſwer the Deſign of ſuch expoſed Plantations, it growing upright, ſtanding Firm, and arriving to a great Magnitude, tho' in the moſt expoſed Situation. A particular Inſtance of the great Service, Benefit and Beauty of this (I may ſay) deſpiſed Tree, is at *Morgam*, a Seat of the Lord *Manſel*'s, near the Sea, where his Garden and fine Orangery is on one Side protected by a ſtately Grove of this Tree, and on another Side by a beautiful Row. The Gard'ner told me, that after ſeveral Eſſays, this Tree was only found to ſucceed beſt, and even to thrive in a Tempeſt. I ſhall ſubmit to thy better Judgment, if this will be worth communicating to the Publick:

And am,

Thy ſincere Friend,

P. Collinſon.

The curious Author of the foregoing Letter has therein given us, as it were, a Plant that we had not before; for what is any Thing to us, without we know its Uſe? and hitherto, this Sycamore has always been eſteem'd a meer Weed, it has never carry'd any Value: The Diſcovery now of its Uſe is like finding out a Man

of

of Merit and Learning, who has lain conceal'd for a long Time, and bringing him from his private Way of Life, to be an Inſtrument of publick Benefit; and ſurely, ſuch Diſcoveries ought to bring Honour to the Diſcoverer. I ſuppoſe that the Gentlemen about the Weſt of *England* near the Sea, may reap great Advantage, by planting Groves of theſe Trees for Shelter, as well as thoſe who live in the Iſle of *Wight*, where the weſterly Winds are very Violent and injurious; and beſides, theſe Trees are extraordinary quick Groves, and come up from Seed the ſame Spring we ſow them.

New Conſiderations concerning the Potting of Orange-Trees.

THERE is one Remark which I have not hinted at before in my Works, and greatly concerns the Potting of Orange-Trees; and that is, when our Mold is light, the Tree may have a larger Pot, than when the Mold is more loamy or heavy; for in the Buſineſs of potting of Orange-Trees, it is to be conſider'd, that my general Directions for giving ſmall Pots to them, is with a Regard to the wa-

tering them by unſkilful Hands; for when Water lyes long at the Root of an Orange-Tree, which it will do if the Earth be heavy, it chills the Root and deſtroys the Plant; ſo commonly, when Trees are in large Pots, but eſpecially in Tubs, they ſuffer by watering; and then it is preſently ſaid, they are over potted, and the Remedy is, to ſhift the Tree into a leſſer Pot: But if an Orange-Tree be planted in a light Mold, it will bear a bigger Pot, and yet indiſcreet Waterings will do it little Harm; for the Water does not lye cold and chilly about the Root, but paſſes freely and the Plant thrives; again, there is a great deal to be ſaid concerning the Difference between Pots and Tubs for Orange-Trees; that is, as far as they concern the Health of Orange-Trees; for Example, Tubs are near as broad at the Bottom as they are at Top, and hold Water much longer in their Bottoms, than a Pot will do, and therefore often hurt the Root; and then again, if an Orange-Tree happens to out grow the Tub or Caſe it is in, then the Roots ſtrike into the Wood of the Tub, and are forc'd to be torn and broken when we ſhift them: *Thirdly*, when it is Time for ſhifting them, it is difficult to diſengage the Root from the Tub: And *Laſtly*, the Tubs ſeldom laſt longer than four Years without rotting, or becoming unfit for Uſe; and

ſome-

ſometimes through the Rotteneſs of a Tub, a Tree is forc'd to be ſhifted at a wrong Seaſon, even ſo as to endanger its Growth; but a well turn'd Pot is not ſubject to theſe Inconveniencies; beſides, how much cheaper a Pot is than a Tub or Caſe! The Pots which I approve off, to be the beſt in their Shape and Make, beſides their Cheapneſs; are made and ſold by Mr. *Thomas Bond*, Potter, at his Work-Houſe in the Mouth of the Creek next the *Thames* at *Deptford*; who with a great deal of Ingenuity, makes all Sorts of Urns, Vaſes, and footed Flower-Pots, printed or work'd in *Baſſo relievo* after any Model; which, when they are painted, are not inferiour to any, that are either carv'd or caſt in Lead, for the Ornament of Peers, or Walls.

Some new Improvements in the Art of Raiſing Cucumbers in the Winter; by Mr. Thomas Fowler, *Gardener to Sir* Nathaniel Gould, *at* Stoke Newington, *Middleſex.*

To Mr. Bradley, *Fellow of the Royal Society.*

SIR,

YOU deſire to know how I went on in my raiſing Cucumbers in the Winter; and ſo I ſend this to acquaint you, that I have done what I promiſs'd, in cutting Cucumbers every Month in the Year; I ſhew'd you ſome in *December*, which I brought to bear, by Means of a new Frame that I invented, and anſwers very well for ſuch Things, becauſe we can move the Plants with the Earth, and all from Bed to Bed as we ſee Occaſion, without diſturbing the Plants; and I can humour my new Frames, ſo that the Hot-Beds ſhall never burn the Plants.

My Frames are made for one Light a Piece, and are ſo ſmall, that we can ſet them, Glaſſes and all into any common Hot-

Hot-Bed Frame ; my Frames are made to take all to Pieces, and have wooden Bars at the Bottom, to hold the Earth in them, till we put the Plants in a Hot-Bed, where they are to ſtand for good ; ſo when a new Hot-Bed is ſo hot, that it would burn any Plants, that I was to plant in it, I can ſet my little Frames upon it, only puting a Board between the wooden Bars at the Bottom of my Frames, and the Dung till the burning is over ; and alſo when the Bed is ſo hot, I do not put on the Light that is made for the great Frame, but only keep on the Lights upon my ſmall Frames ; and when the Bed is in good Temper, then I can take away my Frames, and leave the Plants growing without diſturbing them.

I had alſo Kidney Beans, and Peaſe, in the Winter, and the Spring, which were ſown in Pots, and they bore very well ; and ſo I find it very eaſy, to have any Thing of that Sort, at any Time of Year when one pleaſes. I conclude Sir,

Your humble Servant,

Auguſt 24, 1723.

Thomas Fowler.

To

To Mr. BRADLEY.

An Account of a Farm of 400 *Acres, Part of which, is ſuppos'd to be worn out Ground, and the other Part eſteem'd unprofitable Heath Ground; with the Method of improving the Whole.*

SIR,

I Have been three Times at different Seaſons at the Farm, which I told you I had an Eye upon, for the Place of my Retirement; and ſhall give you as ſhort an Account of the Nature of its Soil as I can.

I find I ſhall have Acres enough, there being no leſs then 400, beſides the Orchard, Stable-Yards, the Ground, the Houſe, Barns, *&c.* ſtand upon. Moſt of it is in a miſerable poor Condition, having been neglected either from the Poverty, or the bad Huſbandry of the late Tenant; ſo it will require not only a great deal of Money being laid out, but the Advice of the moſt ſkilful Huſbandman, to bring it into Order.

It

Its Borders upon a large Heath, ſomething like that between *Wimbleton* and *Putney*; above 100 Acres, of which, belongs to this Farm, and may all be inclos'd. I don't hear that the Tenant ever made 15 *l. per Annum* of theſe 100 Acres.

The reſt of the Farm has been inclos'd, and from the Age of the Trees upon the Hedge Rows, and ſome that ſtand round the old Orchard; it appears to have been done above 40 Years ago; many of the Hedges and Fences are broke down, and the Trees deſtroy'd, excepting ſome Fields near the Houſe, the reſt have been plow'd from Year to Year, while they could produce any Thing. I believe it has formerly been all black Heath, ſuch as is mention'd above, excepting about 20 Acres, which lie low upon the Side of a little running Brook; upon which, there was a pretty good Crop of Graſs, this preſent Year. There are about 60 Acres near the Houſe, which have been kept in pretty good Order, and both the Graſs and Corn upon them, are as good as any in the Country about. The Soil is generally Clay, and the Mold, where Juſtice has been done it, is black. I was by, when one of the Fields was plow'd laſt Winter; I obſerv'd it riſe in groſs Clods; but the Froſt made it fall into fine Mold when it was dreſs'd; and I believe

lieve it may be brought to produce any Thing, which can be expected from ſtrong black Soils. Of one Side of the Houſe, I find ſome Fields, where the Soil for 3 Foot down is Gravel, like that about *London*; upon one of which, there is very good Wheat, the reſt of them are in a very poor Condition.

They ſhew'd me two ſmall Incloſures, which the Tenant had made (upon his firſt coming to the Farm, about ten Years ago) from the black Heath, which had never been plow'd before. The Method he took, was to put a great deal of Lime upon it; after which, he had ſeven Crops of Corn; the firſt four or five, of which, were pretty good; but very bad for the laſt two Years. They have not been plow'd theſe three Years, and as yet, there is little Graſs upon them, except upon the Tops of the Ridges; which being rais'd very high, nothing but bare Clay appears upon the Sides; all the Earth which had taſted of the Lime, being now ſhov'd up to the Top. I made a Man dig down three Foot, and I found it ſtrong blue Clay, with ſome ſmall Veins of Yellow running through it; which laſt, is not ſo ſtrong as the blue, and has mix'd with it ſome ſmall Stones, and when I rub'd this upon my Hand, I found it mix'd with Sand or ſtony Gravel. There is likewiſe a Moiſture in this Yellow, which I obſerv'd

obſerv'd run over the Clods after it was dug up, and made them appear like Yellow Sand without, tho' within they were Blue. Poſſibly to this Mixture of Sand or Gravel, is owing the Mold's falling ſo fine when it is right dreſs'd. I made them likewiſe dig down in the open Heath, and found it of the ſame Nature and Colours, after he got below the Roots of the Heath. But what gave me the greateſt Encouragement, was, that by digging in one of the leaſt Fields near the Houſe, which is at preſent cover'd with very fine Corn, I found the Soil the ſame as this; after we got deeper than the Plow or Dung had gone, which makes me hope, that by good Management, it may all be made equally fertile. I muſt likewiſe tell you, that where the Hedges have not been deſtroy'd, there are very clean, good like Oaks and Elms, ſhort of none of their Age in the Neighbourhood. Having given you this Account of the Farm, and the Nature of its Soil, I muſt beg your Opinion, how far you think it capable of Improvment, and your Advice in the Method I ſhall take in managing of it. It is very probable, that from my Ignorance, I may have omitted ſeverally Particulars, which may be neceſſary for you to be inform'd of; and that I have not expreſs'd myſelf in the proper Terms of Huſbandry; but I hope you will let me know if there is

any

any Thing you desire to have farther explain'd. I shall be at too great a Distance from *London* to have Supplies of Dung from thence, so I must content myself with what can be had upon the Farm. I can have Lime pretty cheap. Neither my Corn, Milk, nor Hay, *&c.* can be brought to the *London* Markets.

June 16, 1723.

To Mr. BRADLEY.

SIR,

FROM Farmers we may collect the common Practice in Husbandry of their respective Countries; but it is from Gentlemen, who have given their Time and Thoughts to Improvements, that we can hope for the most useful Advices, founded upon the Experiments they have made, from their Reason and Knowledge of natural Philosophy.

My Letter of Yesterday's Date, was not gone half an Hour, when a Gentleman who has an Estate in *Dorsetshire*, and who has amus'd himself for some Years, in the

the Way I propoſe to do, came in to me. I preſently acquainted him with my Deſign, and our Diſcourſe run intirely upon Huſbandry, till late in the Evening, he having been ſo kind as to ſtay and dine with me.

I ſhall only trouble you with the Opinion he gave me, for the managing one of the Fields, which is moſt worn out. In the firſt Place, he advis'd the plowing of it, as ſoon as there ſhall fall Rain enough to ſoften it; the Ground being now too hard for any ſuch Thing's being attempted; and in this firſt plowing, he adviſes the throwing down the Earth, from the Top of the Ridges, into the Furrowes. As we have generally Rains in *September*, he propoſes to plow it a ſecond Time, when the firſt dry Weather ſhall come after the Rains; and at this ſecond plowing, he deſires that they may go deeper than he ſuppoſes ever the late Tenant has gone; ſo that two or three Inches of freſh Ground may be thrown up; upon which, he is for throwing a little Lime, which he ſays will, with the Help of the Froſt in Winter, make it fall down fine; and in Caſe I cannot eaſily go deep enough with one Plow, becauſe of the Stiffneſs of the Clay, he recommends the having two, the one to follow the other in the ſame Furrow; this will be the more neceſſary, becauſe of his deſiring this plowing may be croſs

the Ridges; but Men muſt be ſet to work preſently, to make Drains to carry off the Water, and particular Care muſt be taken, to keep Water from ſtanding upon ſuch Land in the Winter. When the Weather is dry in *February* or *March*, he deſires it may be plow'd a third Time, the common Way the Ridges run; but ſtill to throw it down, in Order to the bringing of it more to a Level. Preſently after this plowing, he propoſes, to endeavour to make it fine, by harrowing, and imploying of Men, with proper Tools to break the Clods. This being done, he is for plowing of it preſently again, if poſſible, before any Rain comes; otherwiſe, it will riſe in larger Clods than ever. This fourth Plowing, likewiſe croſs the Ridges, and deep as the ſecond, that it may be open to the Sun all Summer. In the proper Seaſon, he is for plowing of it the fifth Time, and ſowing of it with Wheat, having firſt dung'd it well.

He gave me Directions for preparing of the Dung; of which, I ſhall acquaint you, before I finiſh this Letter.

By this Method, he ſays, I ſhall have a Depth of Mold equally good; but I muſt not plough to the Bottom of the good Mold when I come to ſow, whereby the Seed which falls into the Furrow, will have good Earth below it for Nouriſhment; whereas, the common Farmers by

by neglecting this, loſe a great Part of it, by its falling upon the cold barren Clay in the Bottom of their Furrows. He gives me Encouragement, to expect a great Crop of Wheat by this Method, even from what is now the pooreſt. When the Wheat is cut down, he adviſes the plowing of it, and letting it lye all Winter, and in the Spring to ſow it with Barley, and Rye Graſs, which is call'd with them everlaſting Graſs. In Order to prepare it for the Barley and Graſs, he adviſes the plowing of it twice; firſt very deep, after which, to break the Clods, harrow it till very fine, then plow it a ſecond Time, laying it as flat as you can; ſow it firſt with the Barley, and with the Graſs, before the laſt harrowing is finiſh'd. He acknowledges that this will put me to a great Expence; but aſſures me that the Crops of Wheat and Barley, and the vaſt Crops of Graſs, which I may expect for a great many Years, without being at more Expence, will fully anſwer my Trouble.

He gave me the following Directions, for making a large Dung-Hill, in or near the Field.

To chooſe a plain Spot of Ground, and there to dig a Pit ſloping down to the Middle, then to throw in Horſe or Cow Dung about two Foot, then to throw upon it the Earth dug up, about two

Foot thick, upon which, he deſires me to put ſome Lime; after which, Dung again, and Earth upon that, with Lime as before. The Earth from the clearing of the Ditches, the Road, or the Rubbiſh from the repairing of the Houſe, he tells me are all good Mixtures. Thus I may repeat the Dung, Earth and Lime, till it is large enough for the Field for which it is deſign'd, or while I can have Dung enough, carefully to cover it with Turf, or ſome ſuch Thing from the Sun. To prevent too much Wet coming upon it from higher Grounds, which may be done by making a Furrow with a Plow round it, to divert ſuch Water coming upon it; and likewiſe, to take care that the Moiſture don't run from the Dung-Hill. To make the Dunghill broad rather than too high, and to let all this Mixture lye and ferment together, till I am ready to plow the laſt Time for the Wheat. If I ſhall find any Graſs riſe from the Earth, he adviſes the trenching of it next Spring; which he ſays, will mix it well together, and kill the Seeds or Roots of the Graſs.

I am, Sir,

Your moſt

June 23, 1723.

humble Servant,

G. D.

Anſwer

Anſwer to the foregoing Letters, with the Method of improving the ſaid Land.

To Mr. G. D.

THE Account you have ſent me of your Farm is ſo much to the Purpoſe, that I think myſelf almoſt as capable of judging of it as if I had ſeen it: The Deſcription you give me of the Soils ſufficiently explains to me, that they may very eaſily be made to enrich one another; and as they are the principal Points upon which depends your Improvement, I ſhall begin with examining the Particulars, *viz.*

Heath Soil, which is light and open,

Gravel or Gravelly Sandy Soil, open,

Yellow Clay, the leaſt binding or heavy,

Blue Clay, the moſt binding.

When we have theſe four Soils in an Eſtate, it is my Opinion you cannot complain, for in the ſtiff Soils there is an excellent prolifick Virtue; they abound in vegetable Riches, but by Means of an oyly Quality, or rather a viſcous Quality, which is in them, the Parts are ſo cloſely bound together, that they cannot act unleſs they are open'd; and theſe ſtrong Soils in wet Seaſons ruin Corn, though they produce good Graſs; while the light Soil brings good Crops of Corn, and are not without tolerable Crops of Graſs at ſuch Seaſons.

In dry Seaſons Corn will come to good Perfection, tho' the Straw is ſhort, upon lighter Land, and Graſs will be very little worth; therefore I never preſcribe Graſs to be ſown upon light Land, unleſs it be ſuch as is commonly call'd Clover Graſs; or if the Ground be gravelly, then we may ſow St. Foin, which will bring a good Crop, eſpecially if the Seaſon be not too dry.

When I ſpeak of theſe Soils in this Manner, I ſuppoſe them always upon a plain Piece of Ground, but when there are Hills, there is a great deal of Difference, for the Clay flings off the Water; and tho' the ſandy Hills receive Wet, or drink it up when it falls, yet it ſooner exhales, and the Crops ſooner drop than thoſe upon ſandy or light Earth; on the Plain, the Declivity of the Hills anſwer the End of a Drain

a Drain, and a Hill is more expos'd to the Heat of the Sun, ſo that Hills ſeldom give us any rich Produce, but as I obſerve, are waſh'd by the Rains gently into the Vallies, and thereby give them a rich Manure; ſo that the Vallies bring partly from hence good Crops of every Sort: I allow too, that Vallies have commonly the Advantage of being water'd upon Floods, which oftentimes happens, and from the fine Part of the Earth which comes among the Waters, the Vallies are ſtill better fertiliz'd, beſides the Benefit the Water itſelf beſtows upon the Earth: It is therefore no Wonder that your Ground next the River which lies low, and it may be, is ſometimes overflow'd, will bring good Graſs: We have an Example of that Kind in the Field which lies near the *Thames*, adjoining to the Walk which leads to Lord *Ranelaugh*'s, by *Chelſea*, even in the dryeſt Years.

I come next to Particulars, how one Sort of Soil ſhould be fertiliz'd and improv'd by another; your Clay Ground as it happens to be more or leſs ſtiff and heavy, ſhould have more or leſs of your gravel or ſandy Soil laid upon it, for the Sharpneſs of the Sand or Gravel will open the Parts of the Clay, and after two Plowings will render that ſtiff Soil mellow, and fit to receive Grain; I have ſeen an extraordinary Crop of Barley and Clo-

Clover upon Land order'd after this Manner, inſomuch that the Clover has been cut three Times the next Year after Sowing, and the Year it was ſown, as ſoon almoſt as the Barley was off the Ground it was of great Uſe to feed and fatten Cattle.

When ſuch Ground has lain three Years, turn it up and manure it with your black Heath Soil, that is with ſuch of that Soil as is tender, and open'd by the Roots of the Heath; and it is likewiſe of great Uſe to burn the Heath; and lay the Heath-Aſhes with the Heath Soil, upon your ſtiff Land, this will enrich the Ground extreamly; for however Heath Ground is ſuppos'd barren, yet by Experience I find it to be of excellent Uſe, when 'tis mix'd with Clay, for the Production of Corn.

'Tis to be noted, that where the Soil is very ſtiff, it ſhould be cover'd at leaſt 2 Inches thick with the ſharp Sand or gravelly Soil, but it will keep longer fertile, if it is cover'd at firſt four Inches thick, and eſpecially if it be often plow'd, for every Plowing breaks and opens the Clods of Earth, and mixes the ſharper Soils with the Clay; and that this Plowing may ſtill turn better to Account, and that the Soil may be kept longer in Strength, the Crops muſt be often chang'd.

As for Example, when we have cut Barley that has not had Clover ſow'd with it,

it, we muſt plow our Ground for ſowing of Turnips, which muſt be hough'd after they have appear'd above Ground three Weeks, to ſtand at the Diſtance mention'd in my new Improvement of Planting and Gardening, under the Title of Turnips, and manag'd as is there directed, if there are Markets for them; or elſe one Houghing will ſerve if they are for feeding Cattle, ſuch as Cows, Oxen or Sheep; which, if they eat them upon the Spot, will ſtill enrich the Ground, and with their Dung, and the rotten Leaves and Scraps of the Turnips, muſt be plow'd in early in the Spring, and then if you find the Earth too much inclin'd to clod, lay upon it ſome of your Heath Soil, or ſharp Sand or Gravel, either ſingle, or both together, to be again plow'd with a Breaſt Plow, which is a Sort of Plow much us'd in *Glouceſterſhire*, *Worceſterſhire*, and the Counties adjoining; and this Plow will break the Clods, and mix the ſtiff and mellow Soil together, ſo that 'twill be fit for Peaſe the ſame Spring, and in ſowing of them we muſt obſerve, that if there is a Market to ſell them while they are green, then they muſt be ſown in Rills ſomewhat more than two Foot apart, or if they are deſign'd for Seed, then they may be ſown like Grain, to ſtand about five or ſix Inches apart.

N. B. This

N. B. This Breaſt Plough does not open the Ground above four Inches deep.

When the Peaſe are off, turn up the Ground with the common Plow, and lay the Ground in Ridges for Wheat; you will then find it mellow and open, and you will have no Occaſion to uſe either Dung, Lime, or Chalk, it will bring you ſuch a Crop as will very well ſatisfie the Pains and Care you have been at, and as I have prov'd in ſeveral Places, even excells thoſe Lays which have been fallow'd, and manur'd with Lime, Chalk, or Dung.

In this Way of dreſſing and managing of Land, one great Part of Expence is ſaved, there is no Time loſt, nor does the Soil loſe its vegetative Quality, but if many Sorts of Corn were to be ſown upon it, ſo as to follow one another, the Ground muſt neceſſarily be worn out for Corn, but not for other Things of a contrary Nature, ſuch as Turnips, Peaſe, Beans, *&c.* which draw from the Earth a quite different Nouriſhment.

And when a due Regard is had to change the Crops in the Manner beforemention'd, repeating now and then the Manures as above, the Ground will conſtantly improve: It may at any Time be laid down for Graſs, by ſowing it with Rye Graſs, and Clover, after 'tis made as level as the Ground will allow, or elſe there is a Sort of *French* Graſs with a purple Head, that

is

is a Fortnight forwarder, to cut for Hay than any other I have ſeen; the Farmers about *London* know it by the Name of *French* Graſs.

And now I have ſaid ſo much concerning the Produce of a Piece of Ground order'd according to my own Directions, it may be that the feeding of Cattle may be more profitable than Grain, but that depends chiefly on the Markets. A Lady in *Nottinghamſhire* who has Paſture enough for nine Cows, employs their Milk to make Cheeſe, which is very like that which is ſo famous at *Stilton*: In one Summer ſhe made ſixty Cheeſes of twenty Pound Weight each, which were ſo rich, that at firſt Hand, they were ſold for ſixty Pounds, which is Twelvepence *per* Pound: The Receipt for making ſuch Cheeſes is in one of my former Monthly Books.

As for the Grounds of a contrary Nature from thoſe mention'd before, they are to be reliev'd by the ſtronger or ſtiffer Land; ſo that when Carriages are employ'd to bring the lighter or more eaſy Soil to the ſtrong or heavy Ground, they may carry ſome of the ſtrong Soil to the light Ground; but this need only be done upon ſuch Land as you deſign for Corn, Graſs, Peaſe, Turnips, and ſuch like, for the Lands as they now are, may be render'd fit for ſome very uſeful Crops by common

common Plowing only, without any Manure.

Your Heath Ground newly turn'd up after two Plowings, is fit to plant Saffron upon, which will turn to very good Account; it may bring you twelve Pounds an Acre, one Year with another, if you have Hands near you to gather it; for not only the Goodneſs, but the Quantity of the Saffron depends upon its being gather'd early in the Morning.

Theſe Heath Grounds will likewiſe without manuring bring very good Potatoes, which is a Root ſo uſeful to the Poor, that I am ſurpriz'd any thing ſo valuable has yet hardly reach'd the Country. The ſtiffer Soils without manuring will bring excellent Beans, which may be ſav'd for ſeed to a good Profit, eſpecially the broad *Windſor* Bean: I have ſeen ſome Grounds which have been dug for Brick Earth that were ſtark Clay, and upon one plowing were planted with this Sort of Bean, that brought an extraordinary Crop.

If you have any Deſign of making Beds of proper Manure for your light or heavy Land, it may be done for the light Land in the following Manner: Sink a Trench a compleat Spit deep in the Ground, and lay therein ſome of your Clay Soil; then over that, put a Covering of Chalk or Lime, with ſome Heath Mold,

and

and repeat the ſame over again, 'till you think the Heap is enough for the Ground you deſign, and turn this over about *Midſummer* before you uſe it; but if you deſign an Heap of Manure for your Clay Ground or ſtiff Soil, then make a Layer of your Sand or Gravel ſkreen'd, and upon that, ſome of your Heath Soil, and ſo repeat theſe *Stratum ſuper Stratum* 'till you have a ſufficient Quantity for your Uſe; and in this Caſe, what Rubbiſh you can get from the Repairs of your Houſe, will do well to mix with it: This muſt be turn'd once before you uſe it; but when all this is done, I cannot help hinting, that the greateſt Part of the Farmers are in the Wrong, when they ſuppoſe that Land cannot be eſteem'd fertile, unleſs it produces good Wheat or Grain; and ſo to prepare all their Manure on Purpoſe for ſuch Crops and nothing elſe; or that there can be no rich Manure for Land, but what is compos'd of Dung, or Lime, or Chalk. If one can make as much or more Profit by other Plants as one can by Wheat, or other Corn, it is as reaſonable to ſow or propagate them, as it is to ſow Wheat or other Grain; and I am ſure there is no Soil in the World which will not bring ſome Crops which may be as profitable as Wheat. Your Clay Ground when 'tis firſt turn'd up (tho' I do not make it

an

an Inſtance of what I have juſt now ſaid) will after a little breaking the Clods, bear a rich Crop of Flax, and with a little Care in manuring this ſtiff Soil with the Heath Soil, and the Heath Aſhes, and a little Lime, it will be render'd fit to bear good Hops, for the Management of which I would recommend to you a little Treatiſe, call'd the *Hop Garden*, lately publiſh'd, and dedicated to me, by a Gentleman who dates it from *Maidſtone* in *Kent*, it may be had at Mr. *Richardſon*'s a Printer, in *Saliſbury* Court, *Fleetſtreet*; in which Work you will find the neceſſary Directions for treating the Hop, from the firſt making the Ground, to the drying the Hop for Market. And that this may anſwer ſtill better with you, I would adviſe the making a Plantation of Alders in ſome of the ſtrongeſt Ground upon your Eſtate, from whence you may expect good Poles in 4 Years after planting; nor ſhould the Willow and Black Sallow be neglected, they will produce very good Poles in four or five Years; the Hazle, the Aſh, the Oak, Cheſnut, and Walnut, and eſpecially the *Scotch* Firr ſhould be propagated upon ſuch Ground as yours; they will be very profitable in themſelves, and ornamental to your Eſtate, and ſhelter your Undercrops.

I approve very well of what the *Dorſetſhire* Gentleman told you about the often plowing

plowing your worn out Field, but I am assur'd, the Expence of Dung may be saved since you have so many good Ingredients about you.

Having now explain'd how your several Soils may be improv'd by mixing one with the other, and by appointing to each of them the Crops which are most natural to them. We shall in the next Place consider of the best Way of dividing the Land into Parcels, and of the fencing it with proper Trees and Shrubs.

The four hundred Acres may be dispos'd after the following Manner, *viz.* two hundred Acres for Corn and Grass, one hundred Acres for Pease, Horse-Beans, Turnips, Potatoes, Kidney Beans; for Seed, *Windsor*, or other Beans; for Seed, Saffron, *&c.* and one hundred Acres for Wood; and the fencing in of the whole is one of the first Things to be consider'd.

The Plants or Shrubs for fencing, are the Alder, Hazle, Black Willow, Crab, and White Thorn, the two last especially make incomparable Hedges where they like their Ground; there are Men who make it their Business to get these out of the Woods, but those that are rais'd in the Nurseries are much better, being better rooted and prepar'd for transplanting; where the Crab and White Thorn will not, through the extraordinary Stiffness of the Land, come to any Perfection, the

Black

Black Willow will thrive and proſper, or Alder is ſo well acquainted with all Kinds of Soil, that it will proſper any where.

The Hazle likes a lighter Soil; ſo that one or other of them will hit every Sort of Ground you have upon your Eſtate; I may hint by the By, that the Willows of all Kinds, Poplars, and Alders, delight in the wetteſt Places, and will grow well in any Soil which is not too dry.

The Manner of making the Banks and Ditches is known ſo well to the Country Workmen, that it needs no Explanation; But it is ſometimes neceſſary for the draining of Ground to conſider well how to diſpoſe them, ſo that they may have a Communication with one another, to prevent any ſtanding of Water: The Method which I propoſe for the planting of Hedges for Fences, may be ſeen in the firſt Part of my new Improvements of planting and Gardening, where likewiſe may be ſeen the Manner of raiſing all the Sorts of Plants which I here mention for fencing of Ground, except the Alder which I forgot to touch upon in that Work, and indeed I would adviſe you to begin early with a Nurſery of theſe and other Trees for the Embelliſhment and Improvement of your Eſtate: For though you may think perhaps as many Gentlemen do, that Trees are a long while before they grow to be of any Value, yet you will find if you were

were to buy the young Trees and Plants which you will have Occaſion for from the Nurſeries, they will amount to a conſiderable Sum of Money; beſides the Hazard of their growing by their being two or three Days out of the Ground, between the Time of taking them up, and replanting them: But, as I hinted above, I have not given any Directions for the propagating Alder, I ſhall here do it in few Words: We muſt in *October*, provide a ſufficient Number of Cuttings of the Shoots of the laſt Year, about two Foot in Length, and ſet them ſo deep in the Earth, that about three Buds or Knots may be buried in the Ground; it will be beſt to plant theſe Cuttings in the Places where you deſign them to ſtand, and you will have a good Fence in three Years Time, by the End of which Term, the dry Hedge will be decay'd.

The Trees for Timber, or which may be of Uſe upon your Soils, are the Oak, which will do well upon your blue Clay, and the Cheſnut, upon the ſame Soil, if it is not too ſpringey; upon your gravelly Soil, the Aſh and Elm; the Walnut will proſper well upon ſuch Clay Soil as is the leaſt heavy; and the *Scotch* Firr will thrive extreamly upon your Heath Soil, and indeed ſo will the Pine, and Pinaſter, which in twenty Years Time, will make Trees worth about ten Shilings *per*

Tree, as I have ſeen not only valu'd but ſold at that Price, and at the ſame Time ſome of thirty Years Growth were ſold for twenty five Shilings *per* Tree. Particular Directions for the raiſing and ordering theſe Trees are ſet down in my new Improvements, and in ſome of my former Monthly Treatiſes; but concerning the tranſplanting of Trees, and eſpecially upon your ſtiff Soil, I muſt apprize you of a dangerous Method taken too frequently by the Gard'ners, which ends in the Deſtruction of the Trees, perhaps in three or four Years after they are tranſplanted, tho' they have made a good Appearance for the two firſt Years, and were thought to be in a thriving State.

When the Gardeners I ſpeak of, meet with a ſtrong heavy Soil, which they ſuppoſe to be unfit for the Tree they deſign to plant, the firſt Thing they do, is to dig a Hole or Pit in the Ground where the Tree is to ſtand, and to fill up that Hole with fine prepar'd Mold, and plant their Tree therein, which for a little while will grow, but when the Rains fall, the Water lodging in thoſe confin'd Places, grows ſtagnant, and chills and rots the Roots of the Tree until the End is Death; but to avoid this, I prepare little Hills of the Mold which is to be found upon the Surface of ſuch Clay Ground, and when it is beat fine with the Spade,

and

and has had Time to ſettle, I then plant my Trees upon the Hills in a thin Mud which quickly ſettles about the Roots, and keeps the Air from them, ſo that none fail: If we make ſuch Plantations in *September*, even while the Leaves are green upon the Trees; if the Trees are large, we muſt take Care to ſtake them well againſt the Winds, or if they are very ſmall, that Expence may be ſav'd. In this Way of planting, the young *Fibres* of the Roots are unconfin'd and have Liberty to make their Way where they beſt like: But in the Holes which are dug in the Clay or cold Gravel, the Trees, if they ſhould live 'till their Roots reach ſuch Soil, yet being confin'd as one may ſay from ſucking of more wholeſome Food, they are poiſon'd, and canker till they die.

But if we raiſe our Trees from Seed, in order to make Woods, then I find it beſt to ſow ſuch as the Oak, Aſh, Cheſnut, and ſuch like, with *French* Furze, which ſkreens the young Plants from the Injuries of the Weather, and makes them ſhoot with clean upright Stems: An Example of this we have between *Oxford* and *Abingdon*.

When I conſider farther of your Farm, I cannot omit giving you a Word or two concerning the propagating of Poultry.

In my diſcourſing on this Subject, I cannot better inform you of the Methods

which ſhould be taken for the Welfare of a large Stock of Poultry, than by firſt laying before you the Errors which ſome have fallen into, who had large Numbers of Fowls bought on Purpoſe to make Advantage of them in breeding and fattening them for the *London* Markets.

It is now about two Years ſince ſome Gentlemen in Partnerſhip, provided a large Piece of Ground at *Hoxton*, enclos'd with a Wall, for the entertaining about eight hundred Fowles, beſides Ducks, Turkeys, and Pheaſants; there was a conſiderable Sum of Money laid out in building Houſes for their Shelter, and for fattening them, and for the Hens laying and ſetting; and tho' there was great Skill us'd in the contriving of theſe Neceſſaries for the educating, preſerving and encreaſing of the Poultry, yet it ſeems, that for Want only of due Regard to the natural Conſtitution of theſe Fowls, they were attacked by a violent Diſtemper, which carried off the greateſt Part of them, and by which likewiſe, the very Eggs were render'd ſo imperfect, or I may ſay, were ſo poiſon'd, that hardly one in twenty were prolifick; I conſider'd this Caſe more particularly, becauſe a Deſign of that Nature well carried on, might turn to very good Account, eſpecially where it has the Advantage of the Neighbourhood of the *London* Markets. What I firſt took Notice of as a wrong Step, and what I con-

conceive was the prime Cauſe of diſordering of the Fowls, was the Cloſeneſs of the Houſes where they were confin'd in the Night Time; for though there were Windows in the Front of Lattice-Work, yet they were ſo ſmall, that they could not admit of Air ſufficient to keep the Houſe ſweet, nor ſuſtain the Life of ſo many Creatures together, which are naturally diſpoſed to breath a free open Air.

To have remedy'd this, in the firſt Place I would have advis'd, that the Front and End of the Houſe ſhould be made of open Lattice-Work, in order to admit a greater Fund of Air; and likewiſe that the Floor of ſuch a Houſe ſhould lie upon a Declivity, the better to waſh away the Dung into ſome Reſervoir appointed for it without the Houſe; for this Dung is full of Salts, and a great Enricher of Ground to be ſtrow'd thin upon it, and even the Water which carries it into the Reſervoir, is of good Uſe to ſprinkle upon Land juſt before a ſecond Plowing.

By opening thus the Houſe to the Air, and keeping it ſweet and clean, I am convinc'd that the Fowls would not be ſo inclin'd to droop, as they are when confin'd in a cloſer Place.

In the next Place we muſt conſider, that when we attempt to feed ſuch a Number of Fowls with Brewer's Grains, they ſhould be always freſh, *i. e.* not more than 24 Hours old, for when they turn

ſour, they purge the Poultry with that Severity, as weakens them almoſt beyond Recovery, as I have experienc'd.

But the laſt and great Error which contributed the moſt towards the Deſtruction of this Undertaking, was the wrong proportioning the Number of Cocks to the Hens, for there were not above ten Cocks to accompany about 600 Females; and the Diſtemper which was occaſion'd by this inequality, prov'd to be no leſs than a Pox, which was attended by very violent Symptoms; the Cocks were ſo ſtrain'd in their too much Exerciſe with the Hens, that it was not uncommon to ſee them 3 or 4 Minutes in Company with a Hen without at laſt performing the Office of Generation, and the Hens tir'd by ſuch an uncommon Procedure, had their Parts enflam'd to a very great Degree, and ſoon after there iſſu'd from their Noſtrils a purulent Matter, which after continuing ſeveral Days, ended their Lives. It is not to be wonder'd at, if the Hens in this dangerous Condition, ſhould lay Eggs unimpregnated; or if they had the Cocks Tread in them, that they ſhould bring ſuch Chickens as were unhealthy, and incapable of being brought to any tolerable Perfection.

It is therefore neceſſary, when we deſign to breed Poultry, to allow one Male to ſeven or eight Females, which I find by

Experienc

Experience to be a right Proportion; and where there are more Females to one Cock, the Eggs are uncertain in their hatching, and many are loſt: As for the Objection, that many Cocks will not live together, it is only where they have not Hens enough; but where the Hens are according to the Proportion mention'd above, I have known above a Dozen Cocks agree very well in one Farm-Yard.

I ſhall conclude theſe Directions for the Farm, with taking Notice, that the Enlargement of your Stock of Water by making a Fiſh-Pond or two, will turn to Account as well for the Cattle as for the Fiſh it will produce; and if you are diſpos'd to have as many Eatables upon your own Ground, as may be requir'd for the Service of your Houſe, I believe you will find conſiderable Advantage from ſuch a Warren as I have directed in my Monthly Works.

I am, Sir,

Your moſt

humble Servant

R. Bradley.

A Method of improving Ground in Worceſterſhire, Glouceſterſhire, *or any of the Coal Countries.*

TO introduce this Method among ſuch Perſons as are willing to improve their Lands for Corn, in ſuch Places where Coals are found in Plenty, it will be neceſſary to obſerve two Things.

Firſt, That the Land in ſuch Countries is generally ſtrong Clay, and moſt frequently is that Kind which is call'd blue Clay.

Secondly, That Pit-Coal, when it burns to Aſhes, is generally reduc'd into ſharp Particles, as rude to the Touch as the ſharpeſt Sea Sand; and therefore there cannot be any thing more proper to divide or open the Parts of the ſtiff Clay, than ſuch Coal-Aſhes; but concerning the Salts which are found in Aſhes of all Sorts, I ſhall not here take Notice of them, nor their Uſe in Vegetation; I have already in my former Works mention'd ſomething relating to them.

A Gentleman, who ſome Years ago bought an Eſtate in *Worceſterſhire*, was, as I am inform'd, the firſt that made Uſe of Coal-

Coal-Aſhes to mend his Ground in that County; he had Courage enough to withſtand the Ridicule of the Country People, 'till his Crops open'd their Eyes; and ſince that, his Method is become the common Practice with extraordinary Succeſs: But before I enter upon his Method of proceeding, it may not be amiſs to obſerve, that the Farmers of *Worceſterſhire* were us'd to practiſe that Way with their Land before his Time, which is call'd *Devonſhireing*, which is by cutting off the Turf or Surface with a Breaſt-Plow, and laying it in Heaps over large Faggots of Furze, and ſetting the Furze on Fire in Order to reduce the Turf to Aſhes; by this Means a great Part of the Turf is burnt, but the whole Heap is never ſo entirely mellow'd by ſuch Fires, but that ſome Turfs are left untouch'd, ſo that they muſt be afterwards broken to Pieces by ſome Inſtrument; This they afterwards ſpread over their Land, and plow'd it in to ſow Corn upon.

The Gentleman I ſpeak of which began the Improvement, had upon his Eſtate ſeveral Coal-Pits, and a Parcel of Land over-grown with Furze-Buſhes, ſo that he wanted not for Materials to burn his Turf without extraordinary Charge, and ſo thoroughly, that one of his Heaps would make twice as much good Mold, as the Farmers had in one of theirs.

He

He had ſeveral Coal-Mines upon his Eſtate, and found there great Heaps of the ſmaller duſty Coal, round the Openings or Mouths of the Pits; this he reſolv'd to uſe upon his Land, in Order to burn it to better Purpoſe than his Neighbours did with Furze alone; and therefore inſtead of making large Faggots of Furze, he only made ſmall Bruſhes, big enough to ſet the Heaps of Coal and Earth on Fire; thus having prepar'd a ſufficient Number of Bruſhes, he cut up the Turf, and made his Heaps of Earth and Coal in Lines, about four Feet Diſtance from each other, and to every Heap put one Bruſh only; when theſe Heaps were well conſum'd, he began to plough along the Sides of theſe Heaps, till he had plough'd to a ſecond Row of Heaps, and then ſpread one Row of Heaps upon the freſh plough'd Land, and ſo on till he had plough'd over his whole Ground; then with a breaſt Plough, he mix'd this fine Mixture with the Earth, and ſow'd Wheat upon it, which prov'd ſo extraordinary a Crop, that all the Farmers in his Neighbourhood follow'd his Example; and by this Practice, his Land which was at his firſt coming to it, worth hardly 10*s. per* Acre, is now worth 2 *l. per* Acre.

Conſidering that the ſmall duſty Coal is eſteem'd as nothing worth, and thrown away in the Coal Countries at preſent; this

this Hint may not be dis-ſerviceable to the Farmers in ſuch Places.

Some Obſervations and Conſiderations upon the dry Summer, this preſent Year 1723, *and of Watering, and its Uſe.*

THE Summer of this Year 1723, has been ſo remarkable for its extraordinary Dryneſs, that I think it very neceſſary, to give my Reader ſome Memorandums which I have made concerning it: For as there has not been in the Memory of Man any Thing like it, ſo its Conſequences too are as novel to us; which to be well conſider'd, will very much help our Thoughts in many Affairs, relating to Gardening and Huſbandry.

In the firſt Place, I obſerve that many Miles about *London*, there was not any Rain fell from *January* to the End *June*, that was ſufficient to moiſten the Earth an Inch deep; the little that did fall, did hardly ſo much Service, as the Dew which generally falls in a Night in the Month of *May*; and the Months of *February* and *March* were ſo hot and dry, that in many of the ſtiff Lands, the Huſbandmen could not plow for Barley, but were forc'd to leave

leave their Ground untill'd, till the Rains fell in *July*, the Time of ſowing Turnips.

There was very little Graſs, unleſs it was in ſuch Grounds, as fortunately lay near the River *Thames*, and were overflow'd by it at the high Spring Tides. Every particular of the Gardens, which depended only upon the natural Ground, ripen'd their Fruits above three Weeks before their uſual Time; Aſparagus was cut upon the natural Beds, about the tenth of *March*; and it was common to ſee Cherries ripe upon common Walls, at the End of *April*; and Strawberries were brought to the Markets the firſt Week in *May*; Peaſe and Beans were ſold at cheap Rates, about the eighth and tenth of *May*, and were all clear'd and cut up by the Beginning of *June*, which us'd to be the Time, when the plentiful Crops us'd to come firſt to the Markets; Grapes were in Bloſſom in Mr. *Fairchild*'s Garden, the twentieth Day of *May*, and the *July* Grape, ſweet Waters, and ſome others of the forward Kinds, were all ripe and gather'd before *July* was out; I mean ſuch as were againſt South Walls; and then his great Variety of other Sorts, which us'd to begin to ripen about the Middle of *September*, were ripe and gone about the Middle of *Auguſt*; the Grapes this Year were perfectly good; but beſides Grapes, Melons, Mulberries, Apples and Pears, we have

not

not had any Fruit worth eating this Year. The Cherries were extreamly ſmall, and ill taſted, but abundance of them, and ſo Peaches, Nectarines and Abricots, which were this Year every where in vaſt Abundance, had their fleſh tough, and their Juices ſour, tho' they had all the Characteriſticks of full Ripeneſs; the Trees were ſo loaded with 'em, that they were ſold by the laſt Retalers about the Streets, for three Half-Pence and Two-Pence *per* Dozen. The Badneſs of this Sort of Fruit, was partly owing to the over abundant Crop, which requir'd more Juices to feed them and fill their Veſſels, than the Tree could have drawn from the Earth, if there had been a ſufficient Quantity of Rain fallen; but as there was none at all, during the Time of their Growth, ſo they ſtill were the greater Sufferers: The Veſſels which compoſe the Fruit, had not above a third Part of the Juices in them, which the Fruit requir'd to fill them, and render it as large as it ought to be; and therefore it was impoſſible ſuch Juices could be ſo well digeſted, as if the Veſſels had been full, to have defended themſelves from being dry'd or bak'd by the Sun. Indeed in one or two Places, where ſome few Peach Trees happen'd to be ſhaded, and watered with Skill, I ſaw ſome tolerable good Fruit; but then the Trees had but a moderate Share of Fruit upon them;

them; and ſo in ſeveral Places, that where the Fruit came the neareſt to its natural Size, there it came the neareſt to its natural Flavour.

I obſerv'd likewiſe, that the Drought was ſo violent this Summer, as even to make large Trees, that had been planted many Years, appear as if they were dying and paſt Recovery; and I much fear'd, that hardly a Peach Tree would have been ſav'd, notwithſtanding, I obſerv'd they were generally water'd: But the Waterings that I ſaw, were cloſe to the Stems of the Trees, which can be of very little Benefit; for the Roots which feed a Tree, lye always the moſt remote from the Stem of the Tree; they are the ſmall Fibres of the Roots, only, which receive the Nouriſhment, and it is them which ſhould be water'd when a Tree has Occaſion for it. But then we are to conſider again, that when the extraordinary Drought requires watering the Plants, the Sun is always hot and ſcorching, and exhales the Water which we apply to the Roots, before the Tree or Plant can get any conſiderable Nouriſhment from it; and in ſuch Seaſons, an Hour's Sun will go near to leave a Plant as dry as it was before watering: Now where theſe ſudden Changes happen to Plants, not only Reaſon, but Experience teaches us that they will not thrive, but even are ſometimes loſt, and often

often drop their Leaves; 'tis therefore, I would adviſe the ſhading of ſuch Fruit Trees, as are the moſt warmly expos'd, during the violent Heat of the Day, and not only that Part of the Tree which is above Ground; but that Part of the Ground, likewiſe, where are its fibrous Roots, ſo may the Waterings we give our Trees be more uſeful, by keeping the Ground about the Tree moiſt for a conſiderable Time; and I find, likewiſe, that the larger the plat of Ground is that is water'd, ſo much the better do the Plants thrive that are about it, the Vapour riſing from it moiſtening the Air, and that moiſt Air is imbib'd by the porous Part of the Plants, and nouriſhes them and their Fruits, almoſt as much as their Roots; for this Reaſon, likewiſe, I find it has been ſucceſsful, to waſh the Trees about the Evening with an Hand Engine.

But to return to my Obſervations of this extraordinary Year. The Collections of Auricula's were in the Height of their Bloom at the End of *March*; and by the End of *April*; the Collections of Tulips were out of Flower; both which Flowers bloſſom'd ſooner by a Month than uſual; ſo likewiſe the Hawthorn, whoſe Flowers us'd to be rare enough at *May* Day, were bloſſom'd and all gone long before that Time.

This

This dry hot Seaſon, had likewiſe another extraordinary Effect, in producing prodigious Numbers of Inſects, ſuch as Chafers, Ladycows, Waſps, *&c.* the firſt were in ſuch great Flight about *Maryhone*, that it was very troubleſome walking thereabouts; and for the Ladycows, there were ſuch vaſt Numbers of them in St. *James*'s Park, that the Ground was almoſt cover'd with them, nor were they much leſs numerous in many of the Streets of *Weſtminſter*, and ſeveral Places in *London*. About *Acton* the Waſps were ſo numerous, and had ſo many Neſts in the common Fields, that the Farmers could not Plow for them, till they were partly deſtroy'd by the violent Rains that fell in *July*, before the End of which Month, moſt of the Wheat about *London* was got in, and was extraordinary good, tho' the Straw was ſhort.

At the beginning of *Auguſt*, I obſerv'd the Katkins upon the Arbele, and upon the Hazle, and ſome likewiſe, were as remarkable upon the black Sallow. I may take Notice that this Summer alſo, there were hardly any Kidney Beans to be had; and that the Seaſon was ſo bad for Cabbages, that in *July* they were ſold for one Shilling, and for one Shilling and Six-Pence a-Piece; there were very few but what were made by rolling or tying up, as I ſhall deſcribe by and by. In *Auguſt*, alſo,

alſo, ſeveral Pear Trees and Apple Trees were in full Bloom, which I ſuppoſe was the Effect of the extraordinary Drought; and it may not be amiſs to obſerve that I have experienc'd, that one Way to make Trees bloſſom in Autumn, is to keep them as dry as poſſible in Summer, and to top the young Shoots about the Middle of *June*; by this Means Trees are diſpos'd to bring ripe Fruit about *Chriſtmas*, if they have the Benefit of good Stoves; from all the foregoing Remarks, I conclude that the Seaſons were a Month forwarder than uſual; and for that Reaſon, I expect that all our Winter Pears, will be this Year as good as they generally are in *France*.

An Account of the Manner of making Cabbages, or of blanching Coleworts.

SINCE the blanching of Herbs has been commonly practic'd in *Britain* for many Years; it is to be wonder'd that no Method has yet been taken among our famous Gardeners, to accelerate the ripening or whitening of Cabbages, eſpecially, ſince thoſe which come forward, are known to be ſo profitable in the Markets,

that one ſingle Cabbage will bring as much Money, as four or five which come late in the Year.

Mr. *Keys* of *Tuthil-Fields* tells me, that it has been a Practice for many Years in ſome private Gardens about *Worceſterſhire*, *Staffordſhire*, *&c.* to fold up the Leaves of Coleworts or ſtrong Cabbage Plants, and to tye them together; by which Means, in a Fortnight's Time, the inner Parts will become white, and eat as well as any Cabbage; he has practiced this in his own Garden with ſo good Succeſs, that from him at laſt, moſt of the Gardeners about the Neat Houſes, are fallen into that Method, and have reap'd good Sums of Money from it.

In the dry Years, eſpecially, this will turn to extraordinary Account; for then our Plants, tho' they come from the beſt Seed, will be apt to run, or at beſt will make but thin and indifferent Heads, but here there is not a Leaf loſt; and however the ſtragling Leaves of the Plants may be judg'd uſeleſs before they are ty'd up, they then become exceeding ſweet and agreeable by blanching; but in the Practice of this Method, two Things muſt be carefully regarded.

Firſt, That the Leaves of the Plants we deſign to tie up, muſt be very dry; for if there ſhould be any Dew or Moiſture upon them, they will rot and mildew, when they

they come to be ſhut up from the Air: And *Secondly*, we muſt fold each Leaf carefully over one another, in the exact Order they grow, beginning at the Centre 'till all the Leaves are folded; and then bind them with Baſs croſs-ways, from the Top of the Crown to the Stalk, in ſuch a Manner as the Leaves may not burſt the Bands, which they will be apt to do about a Fortnight after they are ty'd; and indeed we ſhould not do more Plants in this Way at one Time, than we ſuppoſe we can uſe in about ten Days after they are blanch'd, for they will grow unſhapely, and loſe of their Sweetneſs: It is to be remarked, that as ſoon as we have tied up theſe Plants, they ſhould be well-water'd at the Roots, which will fix the folded Leaves in the Order we have plac'd them, and accelerate their Whitening, which at moſt will be in a Fortnight. I think too, that by tying up ſome Colewort Plants in the early Seaſon of the Year, they would eat much better for being blanch'd, but that is according to every one's Palate. I might have mention'd in my Remarks on the dry Summer, that though few Trees were blighted in the Spring by ſcorching Winds, or ſmall Inſects, yet the Herbage was very much annoy'd by the Caterpillar, which ſeverely attack'd the few Cabbages we had, ſo that even of the few, at leaſt one half were

ſpoil'd. Mr. *James Bruſſard*, Gardener to his Grace the Duke of *Devonſhire*, at *Chatſworth*, has lately at my Requeſt, ſent me the following Account of his Method for curing blighted Trees, and Plants infeſted with Caterpillars, which I think may oblige the Reader.

To Mr. BRADLEY, *&c.*

SIR,

I Receiv'd yours, and ſhould be glad to inform you of any thing worth inſerting in your Books; as for preventing of Blights, I cannot ſay any thing to that, but I have recover'd ſeveral Fruit-Trees, as Cherries, Dwarf-Apples, and Plumbs; as alſo Cabbages, and other Garden-Stuff of that Kind, (after the Fruit and Plants were blighted, and began to wither) by a Water made with Tobacco-Stalks; I water'd the Trees with the ſaid Water, and in a very ſhort Time the Leaves and Fruit began to recover, and grow to their full Perfection. This Tobacco-Water hath recover'd thoſe that were water'd with it, and thoſe that were not, it is a Queſtion whether they will live to bear another Year.

I have

I have had two Years Experience of this Water with great Succeſs, and find it anſwer beyond any Thing that I ever made Uſe of. I chiefly found this out by a Man that chew'd Tobacco, who ſpit upon a Newt, and a Toad, and thereby deſtroy'd them, from whence I ſuppos'd it a great Deſtroyer of all Sorts of Vermin.

I made two Hogſheads of Water, by infuſing ſix or ſeven Pounds of Tobacco-Stalks, tho' one may add more as Occaſion ſerves. I am now trying another Ingredient, which I find to be a great Deſtroyer of Inſects, which *Sir*, if it ſhould prove effectual, I ſhall be glad to oblige you with,

I am, Sir,

Your moſt

Humble Servant

James Bruſſard.

The Uſe of Tobacco in ſuch Caſes, has long been practis'd with Succeſs, to deſtroy the Inſects that infeſt Plants, by ſtrewing Tobacco-Duſt upon them, and by making a Fumigation of it under Trees; ſo I doubt not but the Infuſion of Tobacco Stalks in Water will anſwer the End full as well, and may be done with leſs Trouble: But I ſhall take this Opportuni-

ty before I leave the Subject of the deſtroying of Inſects, to introduce a very curious Letter I have lately receiv'd, which has already met with the Approbation of ſo many ingenious Gentlemen that I have ſhewn it to, that I am perſwaded, my Readers would loſe a conſiderable Entertainment if I was not to make it publick.

To Dr. BRADLEY, *F. R. S.*

SIR,

READing lately Mr. *Mortimer*'s Treatiſe of Huſbandry, I took Notice of his remarkable Prejudice againſt the wing'd Species, inſomuch as to wiſh for a Law for extirpating ſeveral Tribes of them. I ſhall in this beg Leave to be an Advocate for theſe Innocents who cannot ſpeak for themſelves; and endeavour to ſhew, that the Services they do us, abundantly ballance the Inconveniences; and that inſtead of being Nuſances, they are Bleſſings, and that without them, we ſhould be like the Land of *Ægypt* under the Curſe, that the Graſhoppers would come, and Caterpillars innumerable, and would eat up all the Graſs in our Land, and devour the Fruit of our Ground, and multiply ſo exceedingly,

ingly, as to creep into our Kings Palaces; and Flies would ſo abound, as to be extreamly incommodious to us.

In Order to make ſome Eſtimate of their Services; I lately obſerv'd a Couple of Sparrows who had Young Ones, and made 20 Turns each *per* Hour; and reckoning but 12 Hours *per* Day, let us compute what a Number of thoſe Vermin were deſtroy'd by that Neſt alone.

40 Caterpillars *per* Hour
12 Hours of feeding *per* Day,

480 Caterpillars deſtroy'd *per* Day,
7 Days ſuppos'd between Hatching and Flight,
3360 Caterpillars deſtroy'd by one Neſt alone in one Week.

But I hear that the Wren, Tom-tit, and other numerous Breeders, deſtroy a much greater Number. And I believe, moſt Birds feed 14 or 15 Hours *per* Day, whereas I have reckon'd but 12; and 'tis certain likewiſe, I might add more Days to the Computation, but I was willing to keep within Bounds.

At a Gardener's where I lodg'd, 5 Miles off this City, we had in the Houſe, Barn, and Stable, ſeven Neſts of Sparrows, two of Robin-red-breaſts, two of Wrens, and one Redſtart; in the Orchard and Hedges, one Chaffinch, one Hedge-ſparrow, two

Tom-tits, two Chats, one Linnet, one Yellowhammer, and one Tit-Lark; and computing at the Rate abovemention'd of 3360 Caterpillars *per* Week, by each Neſt, one with another, no leſs than 69560 Caterpillars were deſtroy'd by the twenty-one Neſts, in one Weeks Time: But ſeveral of theſe Birds breed twice, and ſome thrice *per Annum*, and no Doubt but there were ſeveral other Neſts which were not diſcover'd.

It is obſervable to every Body who is converſant in Gardening, that the farther from *London*, the more the Fruit; and I ſay alſo, the farther from any great Town or City: And the Reaſon is, the little Shelter there is for ſmall Birds, and the great Deſtruction that is made amongſt them by Boys, who take their Neſts, and deſtroy their Young; and Bird-Catchers, who even in Breeding-time catch the Old; ſo that where there is moſt Shelter, there the moſt Birds; and where the moſt Birds, there the moſt Fruit; inſomuch that were I a Maſter of a Garden, I would much ſooner excuſe thoſe who ſtole my Fruit, than thoſe who robb'd a Neſt; for they pay their Landlord in Muſick, and though ſeveral of them are not of the firſt Song, yet the different Notes, and Chirpings of different Birds, do together make a moſt delightful Conſort, as well as their different Colours, Shape, and Size, make a moſt beautiful

beautiful Proſpect: So that they really heighten the Pleaſures of a Country Life, which would be little better than a Deſart without them. The Thruſh and Blackbird not only deſtroy Sluggs, which devour the Colewort, Cabbage, Savoys, French Beans, *&c.* but alſo where not moleſted, feed upon Snails, which deſtroy the Wall-Fruit; the Bullfinch and Tom-tit, are ſaid to deſtroy Buds and Bloſſoms; but I have been inform'd, 'tis a vulgar Error, and that it is a little Worm that they peck out of them, and which would deſtroy the Bud or Bloſſom of itſelf; and which is often found in the ripe Fruit alive, and which the Parent Inſect lays in the Bud or Bloſſom, as a proper *Nidus* wherein 'tis brought to Maturity, and receives Nouriſhment at the ſame Time: But grant that thoſe Birds did ſome Harm to Buds and Bloſſoms; I take it, they do little more than what a judicious Gardener would do himſelf, who is rarely fond of an over-great Bloom, which either dwarfs the Fruit, or kills the Tree; ſo that the Queſtion is, Whether Caterpillars, or Birds? Whether Fruit full grown, or ſtunted? Whether green-leav'd Trees, or bare Boughs, is to be wiſh'd for? I am convinced of the Truth of what I ſay, by melancholy Experience; for having a Proſpect into a publick Garden, which us'd to be frequented by great Numbers of

of Sparrows (by ſome evil diſpos'd Perſons now almoſt deſtroy'd) the Trees by the Middle of *June*, were ſo eaten up by Caterpillars, as to look in ſome of their Branches almoſt as bare as in the Middle of *October*. If it be ſaid, that the Caterpillar lives on Leaves only, I anſwer, it is well known, that when a Tree is depriv'd of its Leaves, either by Flies, Blaſt, or any other Accident, the Fruit never comes to Perfection: And if theſe, and other Vermin, were not deſtroy'd by Birds, they would eat up the Fruit too, and not finding ſufficient, would deſcend from the Trees and devour every green Thing.

The Rook is a moſt admirable Pattern of Vigilance and Society, different from moſt other Birds; they breed near one another, and keep ſo ſtrict a Look out in the Night, that neither Cat, Dog, or Fox, can paſs by them unobſerv'd: They have extraordinary Centinels at every Avenue to the Rookery, who give Notice of every thing that approaches, at firſt by a gentle Call, as if half aſleep, but when Noiſe or Danger draws nearer, they call louder and louder, and then are anſwer'd by the Centinel on every Tree, ſo that the Alarm quickly ſpreads.

In every Rookery that has come under my Obſervation, I have taken Notice of one Rook much hoarſer than the reſt; and him I take to be no ſmall Officer among

mong them; his Neſt is generally near the Centre of the Rookery, upon his taking Wing they all do the like; and when they ſeem to be in a Sort of Combuſtion upon his ſounding ſome particular Notes, they all become ſilent and quiet: They feed upon Worms, and as I hear, Graſhoppers too; which, if true, muſt needs ballance all the Inconveniences objected againſt them.

Nature has made nothing in vain, and Birds are not only delightful, but alſo uſeful and neceſſary to us, inſomuch that I could wiſh for a Law for their Preſervation; and that from the firſt of *March* to the firſt of *September*, it were made criminal to kill, catch, or deſtroy them, their Neſts, Eggs, or Young-Ones: By this Means, the Game will be alſo preſerv'd, for when Boys or other idle Perſons are out ſeeking of Birds-Neſts, they deſtroy all that come to Hand, and conſequently Abundance of the Game likewiſe.

If what is contain'd in this Letter tends any ways towards an Advantage to Huſbandry or Gardening, you are deſir'd to make what Uſe of it you think fit, by

Sir,

Your moſt

Humble Servant

Aug. 13, 1723.

S. C.

Upon

Upon reading the foregoing Letter to Mr. *Dubois*, Treaſurer of the *Eaſt-India* Company, that Gentleman was pleas'd to communicate to me the following Obſervations of his own, which tend to the ſame End, *viz.* the deſtroying of Inſects. In the firſt Place he takes Notice that about the Middle of *Auguſt* the Moth appears, which is the Deſtroyer of the Apple-Tree; its Wings are white, mixt with Cloth Colour: As 'tis in the Nature of Moths to fly only in the Night, ſo he adviſes the ſetting a lighted Candle in an Apple-Tree, at the Time they begin to fly abroad; by which Means great Numbers will burn themſelves to Death, as one may obſerve the Morning following under the Tree; and if we conſider, that every one of theſe Moths will lay about 300 Eggs apiece, which will hatch into Caterpillars the Spring following; then the Deſtruction of an hundred of theſe Moths is preventing the Increaſe of 30000 murdering Inſects, and ſo likewiſe every Caterpillar or Inſect, that a Bird deſtroys, is preventing at leaſt 300 that would otherwiſe be troubleſome to us the following Year.

The ſame curious Gentleman (Mr. *Dubois*) adds further, that he encourages the breeding of Bats, becauſe they feed upon Night Inſects; juſt ſo the Farmers encourage

the

the breeding of Owls, which deſtroy Mice and other Vermin.

While we have yet Inſects under our Conſideration, we may take Notice of two other Obſervations of the aforeſaid ingenious Gentleman, *viz.* that the Martin and Swallow feed upon Ladycows, which are found in their Crops: And he likewiſe obſerves, that to eaſe the Pain occaſion'd by the Sting of a Waſp, it may be done by applying a Copper Halfpeny to the wounded Part, and holding it there for a little Space, it will preſently eaſe the Pain, and prevent ſwelling: And I am aſſur'd by the ingenious Mr. *Milward*, Gard'ner to the Right Honourable *Robert Walpole*, Eſq; that let the Sting of a Waſp be never ſo violent, if we apply ſome of the Juice of the Fig-Tree, either of its Leaves, or Fruit, the Pain immediately ceaſes, and the Swelling abates, though it be ever ſo violent.

Conſidering alſo the Miſchief the Waſp does to all Manner of good Fruit when 'tis ripe, even ſo much that in ten Pounds Worth, they will generally if they be pretty numerous, deſtroy near a third Part. I cannot but recommend to my Reader the Practice of ſome Gentlemen who have clear'd the Country about them of thoſe troubleſome devouring Vermin; though it is at ſome Expence, I think 'tis not Money ill laid out; 'tis but offering to the People about

about the Place a certain Reward for every Waſp's Neſt they ſhall deſtroy, and bring as a Proof of their Work, to be burnt at the Place where they are to receive their Money; and if the Allowance is worth their While, we ſhall have no Reaſon to expect them ever after about that Place. This has been practis'd near *Hoxton*, with ſo much Succeſs, that Mr. *Fairchild* tells me, that he has hardly ſeen half a Score all this Summer in his Gardens, though it was done by the Directions of a Gentleman of that Place ſeveral Years ago, at the Expence of five Pounds and upwards: But indeed I ſee no Reaſon why this ſhould not be done at a Pariſh Expence, ſince it is for every ones Good as well as Eaſe. The Way of deſtroying theſe Vermin, is about the Evening, to put Pieces of lighted BrimſtoneRags into the Holes where the WaſpsNeſts lie, and immediately fling a Spit of Earth over the Hole or Holes, for ſometimes they are ſeveral.

And while we are ſpeaking of Vermin that do Miſchief to Gardens, I ſhall ſay a Word or two concerning the Water-Rat, which is ſo great a Deſtroyer of Fiſh and the Roots of Trees, and preſcribe a certain Way to drive them from their Habitations; we muſt provide a large Number of Crackers, ſuch as the Boys uſe, and place them at four, five, or ſix Inches Diſtance, upon a Yard of quick Match, which

is ſold by the Engineers; when we have dreſs'd as many of theſe quick Matches as there are Holes of the Water-Rats, we muſt with a Willow Twig convey the End of the Match where we have plac'd the Crackers, as far into the Hole as poſſible, only leaving a little of the Match out of the Hole, when this is done, one may provide a few Dogs to be in the Way againſt the Sport begins, which will be very diverting; then three or four Men with Portfires, which are likewiſe to be had at the Engineers, are to be plac'd at convenient Diſtances from one another, and ſo to fire their quick Matches at different Times, as they ſee Occaſion; for every quick Match immediately ſets Fire to the Crackers, which will upon their going off, drive the Rats that are in that Place from their Cells, and perhaps if the Dogs miſs of them, they may take to ſome other Hole, but then he who is next to it ſets Fire to that quick Match, and ſo the Crackers ſend them out again, as well as thoſe that were in before; and by keeping on this continu'd Confuſion among them, they quit their Station, if any be left alive, and never return to the ſame Place.

A Cata-

A Catalogue of new Graffings this Year 1723, by Mr. Fairchild *at* Hoxton.

FOR the further Improvement of Gardening by increaſing of Plants, even ſuch as will neither grow by cutting or Layers, or of ſuch as one cannot readily get any Seed of: Mr. *Fairchild* has try'd ſeveral Experiments this and the laſt Year, in Graffing by Approach or Inarching, which are both new and curious: The following is an Account of ſuch as have taken, and are in a proſperous Condition.

1. The *Terebinthus* upon the *Piſtachio.*
2. The *Cedar* of *New-England* upon the *Virginian Cedar.*
3. The *Cedar* of *Libanus* upon the *Larix* or *Larch-Tree*, which is the more extraordinary, ſeeing the Cedar is ever-green, and the *Larix* drops its Leaves.
4. The *Caſena's*, one Sort upon another.
5. The *Spaniſh Barba Jovis* upon the common Sort.
6. The *Yellow Indian Jeſſamine* upon the *Engliſh yellow Jeſſamine.*

7. The

7. The *Oleanders* upon one another, ſo that he has three or four Sorts upon one Plant.

8. *Geranium* with variegated Leaves, upon a *Geranium* with a ſcarlet Flower, from whence it is reaſonable to ſuppoſe, all the Arboreſcent Kinds of *Geraniums* will *take* upon one another.

9. The *Spurge Laurel* upon the *Mezereon*, the firſt ever-green, the other not; in *January*, this makes a pretty Shew, to ſee the beautiful Bloſſoms of the *Mezereon* intermix'd with the variegated Leaves of the *Spurge Laurel*.

10. The *Lilac* upon the *Perſian Jeſſamine*; ſo likewiſe the white, purple, and blue *Lilacs* may be graffed or budded upon one another.

11. The *Carolina Haw* upon the common *Hawthorn*.

12. The *Red Curran* upon the *Black Curran*, but the Taſte of neither Fruit is changed, nor any Property alter'd, no more than any other Particular Fruit loſes its Properties by being engraffed upon a wild Stock.

13. *Curran* upon the *Gooſberry-leav'd Curran*.

14. *Live Oak* of *Virginia* upon the common *Engliſh Oak*.

15. *Ilex* upon the common *Engliſh Oak*.

16. *Holm-Oak* upon the *Engliſh Oak*.

17. *Cork-Tree* upon the *Engliſh Oak*, and ſo may be graffed all Kinds of Oaks upon one another.

18. The *Anti-Euphorbium*, upon the *Senecio*, *Afric*, *Arboreſc*, &c.

19. The *Variegated Tree Sedum* upon the common *Tree Sedum*, and likewiſe ſeveral other Kinds of *Sedum* upon the *Tree Sedum*.

20. *Cotyledons* of ſeveral Kinds upon the *Tree Sedum*.

21. Vines upon Vines.

Beſides theſe Graffings, which anſwer the End of propagating curious Plants with little Trouble, there is one Thing very remarkable which happen'd in Mr. *Fairchild*'s Garden, from the budding or inoculating ſome of the Paſſion-Tree, whoſe Leaves were ſpotted with yellow, into one of that Sort of Paſſion-Tree which bears the long Fruit; now, though the Budds did not take, yet in a Fortnight's Time after budding, the yellow Spots began to ſhew themſelves about 3 Foot above the Inoculation, and in a ſhort Time after that, the yellow Spots appear'd on a Shoot which came out of the Ground from another Part of the Plant: Is not this as plain a Proof of the Sap's Circulation, as the Inſtance of the Jeſſamine mention'd before, or the Inoculation of the Small-Pox, is an Inſtance of the Circulation of the Blood? For my Part,

Part, I can't ſee how any Objection can be made againſt the many evident Proofs that has been given of it, as well in the Caſe of reverſing of Plants, and rejuvenizing them, as in ſeveral others mention'd in my former Works; but indeed I am not inſenſible that when I write, my Works fall into the Hands of two Surts of People, the one, who, deſiring to be inform'd, are curious and inquiſitive, and would willingly learn; and the other, who finding themſelves Men by the Number of their Years, are either aſham'd of aſking Queſtions leaſt they ſhould ſeem ignorant, or elſe think that their Age is a ſufficient Warrant for their Obſtinacy, and Talking of Nonſenſe: For the firſt, I have that Charity and Generoſity, that I ſhall always, as far as my Time will permit, think myſelf well employ'd in inſtructing them; but for the latter who are ſure they know enough already, and reſolve againſt Improvement, they are only fit to accompany one another.

But there is one Queſtion which is a great ſtumbling Block to thoſe who are but Beginners in the Knowledge of Circulation of Juices, and that is, How long Circulation is performing? (to uſe their own Terms) In Anſwer to which, they muſt underſtand that the Motion of the Juices is conſtant, and that whatever impedes it,

or quickens it beyond its conſtant Courſe, tends to weaken the Plants; for the Secretions are not then rightly made; beſides, the Motion of Juices is not in every Plant like, in ſome quicker, and in others ſlower, for the Circulation of Blood in one Animal, is not perform'd with the ſame Rapidity, that it is in another, as we find by the Beats of the Pulſe; the Motion of the Pulſe of a Snail, or of its Heart, as one may obſerve by taking off the Shell, is ſix or ſeven Times ſlower than the Beats of the Pulſe in an Human Body; and the Pulſe of an Human Body is more than that ſlower than the Pulſe of a Squirrel; ſuppoſing all three to be in an equal State of Health. Now, as this Circulation muſt be continual from the very firſt of Life to the Moment of Death; ſo we muſt conſider too, that the Food or Nouriſhment receiv'd every Day, adds to the Juices that were in the Body before, which muſt either encreaſe the Bulk of the Body, or elſe be the Occaſion of a Diſcharge of Juices from that Body, or both together; ſo that were it poſſible to fix upon any one Drop of Juice in a Body which one might ſuppoſe was the Leader of the reſt through all the Channels, 'till it gain'd the Place it firſt ſet out from; what with the new Nouriſhment that would be receiv'd into the Body, and the Parts that would be ſecreted from this Drop, in its Paſſage, ſuch

ſuch Drop as well as all the reſt would be ſo chang'd and alter'd, as to be no more the ſame it was at firſt; but if by the Queſtion they aſk, they mean, How long the infected Matter inoculated will be before it ſhews itſelf in the remote Parts of the Plant? Then we anſwer, that it is parallel with the Caſe of inoculating the Small-Pox on Human Bodies, which is ſooner or later in ſhewing the Poiſon, as the Body is in more or leſs Vigour, when the Inoculation is made; or elſe from the Force or Power of the Poiſon inoculated, which ſometimes is not ſtrong enough to engage the whole Body of Juices, and then does not appear at all, or very late; it is ſometimes 3 Days, ſometimes 5 or 6, and ſometimes ten Days or more, before the Inoculation of the Small-Pox has diſpers'd itſelf over the Body, and infected the Blood enough to ſhew itſelf; and in Plants, we find that in the Caſe of the Paſſion-Tree abovemention'd, it was a Fortnight before the yellow Spots appear'd, and in ſome Plants, it is longer.

It is remarkable that the yellow Spots began firſt to ſhew themſelves in the new Branches, which as it appears are of very quick Growth, ſhooting about three Inches and half *per* Day; I having meaſur'd one Shoot of a Paſſion Tree, which in its Growth, from the Beginning of *May* to the End of *September*, was thirty two

Foot in Length; and it is in these quick Growers that I find the Variegations, after Inoculations soonest shew themselves.

To Mr. Bradley, F. R. S.

SIR,

AS you desire to know what new Curiosities I've got; this is to acquaint you that I have a new Sort of Passion Tree, that bears Fruit very well upon small Plants in Pots; I have now several of them full of Fruit, and I have never seen any before like them; as for Graffings which I have new this Year, there is the Laurel upon the Plum, and the Laurel upon the Peach; what I think the most extraordinary, is the Fig upon the Mulberry. The Passion Tree and the Vine, is joyn'd together by the Way, which I call touching, and I believe it will hold; I have several Sorts of Myrtles graffed upon one another, but those you have seen before;

I am,

Your humble Servant,

Hoxton, August 20, 1723.

Benjamin Whitmill, Gardener.

Obser-

Obſervations and Experiments upon various Subjects in Gardening; beginning with extraordinary Remarks upon Muſhrooms, and the Manner of their artificial Production.

I. NOtwithſtanding the Value which is ſet upon the Champignon or Muſhroom, by Men of polite Taſte, and the extraordinary Price which thoſe of the beſt Sort will bring in the Market; I have not been able to perſwade any of our Market Gardeners, to make that Branch of Gardening their Study or Practice; nay, even tho' they have been invited to it by Perſons of Honour, who would take all off their Hands that they could raiſe. In the Autumn Seaſon indeed, it is common to ſee them appear naturally upon old hot Beds that have been ill made; and then it is almoſt as frequent, that we are told thoſe Beds were made on Purpoſe to produce them; but theſe Beds are inconſtant giving a few for a ſhort Space, and leave us the greateſt Part of the Year without them; whereas, if the Beds are rightly diſpos'd and order'd ac-

cording to Art, we may have them at Pleaſure in any Seaſon.

I have already obſerv'd in ſome of my former Works, that the *French* Way of making Muſhroom Beds, (I mean the Method which is us'd about *Paris*, where we may continually find ſeveral Acres of theſe Beds) is to make each Bed at twice, and that we muſt only uſe pure Stone Horſe Dung; each Parcel to be toſs'd up fifteen Days in a dry Place before we uſe it, and kept during that Time free from Wet; which muſt unavoidably be obſerv'd, or we cannot hope for good Succeſs, and there ſeems to be good Reaſon for it; for by this making of the Bed at twice, the Bed partakes of two different Heats at the ſame Time; the firſt Part by that Time it has been made fifteen Days, begins to decline in its Heat, and then the freſh Dung coming to be lay'd upon it, increaſes in its Heat as the firſt Part declines, which affords us much ſuch another changeable Variety as we find in the Seaſon, when Muſhrooms appear of their own Accord; and it is ſuch Irregularity of Seaſon, that gives Life to the Seed or Spawn of the Muſhroom already in the Ground. It is to be obſerv'd likewiſe, that when the Bed is quite made, we muſt not cover it above an Inch thick with fine Earth; for if it is more than that, if the Muſhrooms chance to come up,

up, they will be ſmall and watery, eſpecially, if the Earth be ſomewhat ſtiff; indeed if the Earth be extream Light and open, if it be lay'd a ſmall Matter thicker than an Inch, it will not do much Harm.

I have obſerv'd that the *French* Gardeners, when they make Beds every Month, they put Pieces of the Muſhroom Earth, as large as Walnuts into the Earth which covers the Bed, juſt in the Line where the two Makings of the Bed joyn; for 'its in ſuch a Place where the Muſhroom Earth, *i. e.* that which is full of the little white Strings and Bulbs of the Muſhrooms, meet with the declining and encreaſing Heat, which is ſo neceſſary to make them ſpread and grow; and moreover, the Horſe Litter which covers the Bed, contributes to retain the Vapour which riſes from the Bed, and imitates in ſome Meaſure, what we call a Fog; and beſides, only admits a glimmering Sun to reach the young Buttons of the Muſhrooms; for too much Sun, dries the young Muſhrooms and ſtops their Growth, and too little, ſuffers them to rot; therefore it is neceſſary the Litter we cover our Bed with, ſhould be clear'd from all Dung, and be laid upon the Bed very light and free. I am the more particular in theſe Obſervations, becauſe ſome Beds have been made for the Production of Muſh-

rooms

rooms after my Directions, as has been ſaid, that wanted every one of the Particulars I have here reaſon'd upon; and at laſt when it was found that no Muſhrooms appear'd, the Fault was laid at my Door. But beſides theſe Errors of making the Beds at once, and with old Dung; when I came to ſee them, they were made flat a Top, which is a Poſition that a Muſhroom does not like, it holds the Water to much, and they become rotten thereby; but upon the Side of a Slope, as in the Bed I direct, is the Situation they delight in. We ought alſo in two or three Days after we have planted our Bed with Muſhroom Earth, to be very careful to examine it Day after Day; for if a Muſhroom ſhould come up and rot upon the Ground, it will breed Maggots or Worms, that will deſtroy all the young Spawn or Buttons in the Ground, and then our Labour is all loſt; and beſides, this Examining our Beds every Day, will keep the Littier light and open upon the Beds, and ſo promote the Muſhroom Growth.

To examine the Courſe of the Muſhroom Fibres, we ſhall find at proper Diſtances, Knots or Knobs joyning to the Strings of the Roots, each Knot about the Bigneſs of a Pin's Head, running juſt under the Surface, in the Manner of Potatoe Roots; which Knots in a few Days,

if

if the Bed has any Heat, will come to be Muſhrooms fit to gather; and we muſt by no Means let any of them remain upon the Bed after they begin to ſpread, for then they will breed Worms that will deſtroy all the young ones; ſo in the Gathering them, we muſt have no leſs Care to take all the broken Parts of the Muſhrooms away, and particularly every broken Stalk, for they firſt are attack'd by the Worm; ſo likewiſe when we gather them or pull them out of the Ground, if we find any ſmall ſpawn about the Roots, we are to ſeparate it from the Root, and plant it immediately in ſome Part of the Bed where there are the feweſt Muſhrooms, uſing this Spawn very gently, ſo as not to bruiſe it; and in a few Days, in Proportion to the Heat of the Bed, it will grow and produce Muſhrooms.

When we plant any of the Muſhroom Earth about Autumn upon old decay'd Beds, I find it will be about ten or fifteen Days before they appear; but when we find once that the Roots ſpread, and begin to be full of Knots, then we may break off ſome Pieces of that Earth, and plant them at a Foot Diſtance; and by ſuch Means, in a little Time, the whole Bed will be cover'd with them; after this Manner from one Single Root, I have in about fifteen Days Time had a whole Bed full, tho' the Bed was quite without Heat;

but

but then it was at a Seaſon when they came up naturally, but when that is not, we cannot hope for good Succeſs in planting them, without ſuch an hot Bed as I have directed.

From what I have here mention'd, it appears that the Muſhroom increaſes by the Root, and may be tranſplanted as well as another Plant; but whether it has Seed or not, is yet a Quæry: But that the Directions I have given concerning the Manner of theſe Beds, may ſtill be beter underſtood, I have prevail'd upon the ingenious Mr. *Fairchild* of *Hoxton*, to make one which is now well furniſh'd with Muſhrooms; as alſo at Mr. *Benjamin Whitmils*, Gardener, near the ſame Place, which has the like Succeſs; ſo that now I have fulfill'd, what I promis'd in ſome of my former monthly Papers, *viz.* to give full Inſtructions for the making Muſhroom Beds.

Concerning a Pear Tree that bears Fruit twice a Year; at Mr. Chapman's, *a curious Nurſery Man, near* Pitfield-Street, Hoxton.

II. THERE are ſome Inſtances of Trees which naturally bear Fruit twice, and now and then three Times in a Year: The moſt remarkable are the Fig, the *Glaſtonbury* Thorn, and the Vine; but the twice bearing of theſe in one Year, depends ſo much upon a favourable Seaſon, that it is very rare for them in *England* to ripen the Fruit of both their Seaſons; the Attempt however of bearing Fruit twice in a Year, may well enough ſerve to inform us, that their native Countries lye between the Tropicks, where there are two Seaſons in each Year, which equally does the Office of Summer; and for that Reaſon it is natural to Plants of ſuch Climates to be diſpos'd to bloſſom, and bear Fruit at both thoſe Seaſons; and I have obſerv'd in another Place, that all Trees and Plants, let them come from where they will, do manifeſtly preſerve their own natural Seaſons of Growth, what-

whatever Difference there happens to be between their own and this Climate, tho' they are often Sufferers in the Attempt by cold Weather, unleſs they be houſed: But in Mr. *Chapman*'s Pear Tree, there ſeems to be ſomething rather more particular, for that never fails in the worſt of Years to ripen two Crops of good Fruit, which only differ in the Time of their ripening, and not otherwiſe, as has been conjectur'd; unleſs it be, that the Fruit of the ſecond Crop, is ſomewhat ſmaller than the other.

The preceding Year, Mr. *Chapman* preſented me with a Branch, whereon there was ſeveral of the firſt Fruit almoſt full grown, and ſeveral of the ſecond Crop were juſt then ſet, and both theſe were found upon one ſingle Shoot, growing from Buds which were alternately plac'd upon the Shoot; and alſo, 'twas obſervable that Shoots of this Kind were found in every Part of the Tree, and not any diſtinct Shoots which brought only Fruit of one Crop, or ſingle Shoots which brought forth only of the other Crop; for that would appear to be no more, than what is commonly done by Graffing, *i. e.* to have Branches ſeparate upon the ſame Tree which brings Fruit that ripens at different Seaſons. Indeed I find this extraordinary Summer, that a Sort of white Fig in Mr. *Fairchild*'s Garden, ripen'd two Crops of

Figs

Figs very well even ſo as to gather of the ſecond Crop ripe on the tenth of *September*; and at the ſame Place, I obſerv'd a Sort of Vine which had a ſecond Crop of Grapes, almoſt ripe about the Middle of *September*, which I ſuppoſe might partly happen from an extraordinary Pruning Mr. *Fairchild* gave them this Year, as well as the extraordinary Seaſon; tho' without either of theſe, they would have attempted a double Crop, but then, without theſe Helps, they would not have ripen'd.

I ſuppoſe, ſuch Plants as ſeem ſo naturally to bear twice a Year, are made up of Veſſels of different Kinds, which conſequently contain Juices of different Kinds, the one Sort taking a longer or ſhorter Time to digeſt the Juices, than the other; and therefore this Doubling the Seaſons in bearing may be brought to paſs: The Veſſels which lead to the Buds that bloſſom in the Spring, have their Juices ſufficiently ripen'd then, for the compleating the Bloſſom; whilſt thoſe Veſſels which lead to the Buds which bloſſom in *July*, are crude and immature, and require ſome Months more to ripen them for Fruit bearing.

Mr. *Chapman* tells me, that he propagates this Tree which is call'd the Twice Pear, by Graffing, and that thoſe he has graffed from it, are like it in every Reſpect; but then, as this is done by Graffing,

we

we muſt conſider that a Graff has 3 or 4 Buds to it, and ſo may have all the Qualities in it, that are found in the old Tree, or if there was but one Bud of it to ſhoot, perhaps the Veſſels of a different Sort that muſt be in the Wood of the Graff, may find Means to ſhew their Diſpoſition hereafter; for every Veſſel in a Plant has ſome Correſpondence with the reſt: But I have Reaſon to queſtion whether a ſingle Bud of this Tree being inoculated on a Stock, will afford any more than ſuch Juices or Veſſels as are neceſſary to bring Bloſſoms of one Seaſon without ever offering to bloſſom in another: And if by trying this, we find that one Inoculation will only bloſſom in *July*, and another will only bloſſom in *April*, it will diſcover a great Myſtery in the Nature of Plants. I may take Notice in this Place, that there is a Pear-Tree in *Norfolk*, which brings Pears of very different Kinds, the one a Summer, the other a Winter Pear, and yet both theſe Sorts are found upon one Twig, and even proceeding from the ſame Bud, nay and ſome of the Pears partaking both of the Summer and Winter Kind; like the Apple in *Devonſhire*, which I have treated on in my Papers of the foregoing Months; wherein I have alſo propos'd a Method of Graffing by Approach, call'd *Touching*, and have given a Cut of it. I believe it is by ſome ſuch Means that in *Marlborough* Foreſt

reſt, there is now the Hazle join'd with the Hawthorn, ſo as to make one Tree, but whether they are ſo united, and their Juices are yet ſo well mixt, as that they flow together in the ſame Veſſels, cannot be ſo well reſolv'd, as by graffing a Branch of the Plant which partakes of both, upon an Hazle, or upon a White-thorn, upon either of which it will take, if the Veſſels of both are united; unleſs indeed we were to cut one entirely from its Root, then we ſhould ſoon ſee how much it depended upon the other. This leads me to conſider the numerous Graffings mention'd by the Antients; and as I think nothing can ſeem more different in Nature, than the Hazle and Hawthorn, which by *Touching* are thus united or grown into one another; ſo I have more Room to think that what they have offer'd to us about graffing Plants of ſeeming contrary Natures, upon one another, is not ſo irrational as at firſt it appear'd to me; not conſidering that they might uſe ſuch a Graffing as this which I call *Touching*, and is but lately reviv'd with us. By the ſame Means Mr. *Whitmil* abovemention'd, has this Year joined the Fig with the Mulberry; but Time will ſhew how far this Graffing will be ſucceſsful.

A Remedy for Orange-Trees, and other Trees that are troubled with the ſlipping of their Bark.

III. A Curious Gardener ſends me Word, that he has large Orange-Trees, which from Time to Time fling off their Bark in Flakes of about a Foot long; the Diſtemper ſhews itſelf by a Speck of Gum iſſuing out of the Bark, and in a ſhort Time after, the Bark flies from the Wood, and at the ſame Time, great Numbers of ſmall black Inſects are diſcover'd between the Wood and Bark. What is the Remedy?

The Method I propoſe to remedy this Evil, is firſt to cut the diſtemper'd Bark from the Wood, 'till there is nothing to be diſcern'd in the Wound but Health and Freſhneſs, without any Spots; then waſh the bare Wood with Water, wherein Tobacco-Stalks has been boyl'd, let the Water at that Time be a little warm.

To prepare the Water, take about one Pound of Tobacco-Stalks, and boyle it for this Uſe in a Gallon of Water, about a Quarter of an Hour: It is a ſovereign Remedy againſt Inſects, and eſpecially thoſe in

in the Bark of Trees, as well as thoſe in the Skins of Animals.

When this is done, take ſome *Camphire*, beat very ſmall, and apply the Powder to the naked Wood, two or three Inches above and below the Inciſion, which may be done by dipping a linnen Cloth in melted Bees-Wax and Rozin; and while it is warm, ſtrewing the Powder upon it, and then immediately applying the Plaiſter to the Place, and binding it on with Baſs upon the diſtemper'd Part; this will deſtroy even the Eggs of thoſe Inſects, and when it has been on about a Year, take it off, and then you may uſe Cow-Dung if you pleaſe to ſupply the Place. The two Ingredients which I mention in this Caſe, have deſtroy'd many Kinds of Inſects that infeſt Plants; and from the Experience I have had of them, I doubt not but this Preſcription will have a good Effect upon this Diſtemper of the Orange-Tree; when this is done, we may water the Heads of the Trees now and then with an Infuſion of Tobacco-Stalks in Water.

Obſervations concerning Vineyards *and their Produce, with ſome Account of the Vineyard near* Bath.

IV. SINCE I find that what I have already ſaid in my former Writings, has had ſo much Influence over ſome *Engliſh* Gentlemen, as to diſpoſe them to undertake the planting of Vineyards with us; I ſhall in this concluſive Piece give my Readers ſome Obſervations I have lately made concerning their Improvement.

I ſhall begin with taking Notice of ſome Particulars relating to the celebrated Vineyard near *Bath*, which has made ſo much Noiſe in the World: In the firſt Place as to the Situation, it lies upon the Side of a ſteep Hill, facing the South, the Ground very rocky or ſtony: In this Place, the Vines are planted in Lines about ſix Foot aſunder, and are treated much after the Manner that Vines are manag'd about *Germany*. The Sorts of Grapes here planted, are the White Muſcadine, and the Black Cluſter-Grape, which, however, they are not of proper Wine-making Grapes, and are not the moſt early in ripening,

ripening, yet there was made ſixty-ſix Hogſheads of Wine four Years ago, from this Vineyard, which contains ſix Acres of Ground: But in the Year 1721, there was made, as I am inform'd, not above 3 Hogſheads, and the laſt Year, 1722, when I was there, *July* the 26th, the Vines were then hardly in Bloſſom, ſo that little could be expected from them that Year; but as there was then upon them a great deal of good bearing Wood, I ſuppoſe this Year they may produce a good Crop, eſpecially conſidering the extraordinary Summer we have had: It was indeed no ſmall Surprize to me to find the Vineyard Grapes at *Bath*, in that fine Situation, ſo late in Bloſſom, when there had been ripe Grapes above ten Days before at Mr. *Fairchild*'s at *Hoxton*, which ſtands upon a ſtrong Clay, and in a flat Country; and in Mr. *Warner*'s Vineyard at *Rotherhith*, the Grapes were then near fully grown, tho' they had not the Help of ſo favourable a Situation; but as this was plainly ſo in Fact, it was evident, that the Difference muſt proceed from the Sorts of Grapes, as well as from the Management of them; and when we come to compare the Quantity of Wine which the *Bath* Vineyard produc'd in one Year, *i. e.* ſixty ſix Hogſheads, with the Quantity of Wine produc'd in Mr. *Warner*'s Vineyard, we ſhall ſtill find how much the Sort of Grape ſhould be conſider-

ed, that we deſign to make Wine of: For it is experienc'd, that ſome Kinds of Grapes will yield near Half as much more Juice as others, though we carry the ſame Meaſure of each to the Preſs, and as I take it, the Black Cluſter-Grape yields the leaſt Juice of any; and then, if we compute an Hogſhead of ſuch Wine worth ten Pounds, as the *Bath* Wine was ſold for, then the ſixty-ſix Hogſheads at *Bath*, would be worth ſix hundred and ſixty Pounds; but if the Grapes had been of a more juicy Kind, then the ſame Quantity of Grapes would have produc'd ſo much more Wine, as would have made it worth nine hundred and ninety Pounds, which is a vaſt Difference; tho' indeed no one would diſlike an Acre that will yield him yearly above an hundred Pound, as the *Bath* Vineyard would do with the above Quantity, if it would bear as conſtantly as Mr. *Warner*'s Vineyard, which has not yet miſs'd

But that we may ſtill make the Compariſon more juſtly between theſe two Vineyards, I ſhall give my Reader an Obſervation or two which I made this Year at Mr. *Warner*'s, which I am perſwaded, will give him a very agreeable Satisfaction.

I obſerve in the firſt Place, that an hundred Stands of Vines, two Plants to a Stand, in their firſt Year of bearing a Crop, at Mr. *Warner*'s, made ninety-five Gallons of

of Wine, and the ſmalleſt Bearer among thoſe Vines this Year, had upwards of ſeventy-five Bunches of Grapes, but many of them above an hundred Bunches apiece; and yet the bearing Part of each Vine did not ſeem to fill much more Space than a Buſhel Meaſure; after this Rate, then, an hundred Vines manag'd after Mr. *Warner*'s Way, at the loweſt Reckoning, *i. e.* 75 Branches to each Vine, will produce 7500 Bunches of Grapes; but then we muſt conſider what Proportion of Weight each Bunch will bear to one another, for there were ſome ſmaller, and ſome larger ſo that I ſhall compute only 60 Bunches upon each Vine, at one Quarter of a Pound Weight each Bunch, and then an hundred Vines will produce ſix thouſand Bunches of a Quarter of a Pound each, or about fifteen Pound Weight of Grapes upon each Vine. But that we might know what might be the Produce of theſe Grapes in Wine, I took an Opportunity to viſit Mr. *Fairchild*, who has ſuch Variety of Sorts of Vines for Vineyards, and with him try'd the following Experiment: We gather'd a Bunch of Grapes of the ſame Sort with Mr. *Warner*'s, from a Standard Plant; the Bunch happen'd to weigh juſt one Quarter of a Pound, and preſſing it as hard as we could between two flat Pieces of Wood, the Quantity of Juice which

we expreſs'd from it, weigh'd two ounces and an Half, and meaſur'd above Half a Quarter of a Pint, which makes ten Ounces of Juice from one Pound of Grapes, is after the Rate of $\frac{1}{2}$ in Juice, and $\frac{1}{2}$ in Hulls; now allowing Mr. *Warner*'s Vines to bear 60 Bunches apiece, of one Quarter of a Pound each, and each Pound of Grapes to produce ten Ounces of Wine; then a ſingle Vine bearing 15 Pound Weight of Grapes, will yield of Wine 9 Pints or Pounds, and $\frac{5}{8}$ Parts of a Pound, which makes one Gallon, one Pint, one Quarter, and Half Quarter of a Pint, ſo then the Produce in Wine of one *hundred Vines*, will be *one hundred and ſeventeen Gallons, one Pint and Half.*

Let us examine in the next Place how many Vines a Vineyard regularly planted, may contain in an Acre or rather, how many Vines there ſhould properly be in a Vineyard of ſix Acres, which is the Dimenſion of the Vineyard near *Bath*, and then let us compute the Quantity of Wine ſuch a Number of Vines will produce, according to the foregoing Calculation.

Firſt, Our Lines of Vines ſhould run North and South, and ſtand ſix Foot from one another, unleſs upon a Hill that is very ſteep, and then they may run Eaſt and Weſt; for as the Lines of Vines will ſtand one above another, they will then have the greater Share of the Sun, for they

they need not be kept above four Foot high; but however the Lines run, there ſhould be two Vines planted together in an Hole, and from the Centres of theſe Holes where the Vines ſtand, we ſhould allow ſix Foot; ſo then our ſix Acres will take up of Vines to plant them about 14500 Plants, or a ſingle Acre about 2416 Plants, which if they are well prun'd and ordered, and no Froſts or Blight happen to take them, will produce of Wine, according to the above Reckoning, 16965 Gallons of Wine in one Year, or a ſingle Acre after that Rate, will produce in one Year, 2832 Gallons of Wine, which is 44 Hogſheads, 60 Gallons. The Account then ſtands thus, at the Rate of 10*l. per* Hogſhead, each Hogſhead containing 63 Gallons: 269 Hogſheads 18 Gallons, the Produce of ſix Acres, at ten Pounds each Hogſhead, amounts to 2690 *l.* or 44 Hogſheads, 60 Gallons, the Produce of one Acre, at *Ditto*, amounts to 450 *l.*

Tho' I have been as exact as poſſible in this Calculation, yet that there may be no Room for Objection, let us ſuppoſe only ten Pounds of Grapes to each Vine, and we may then make about 30 Hogſheads of Wine, from an Acre.

But then we are to conſider ſomething of the Expence of planting and keeping theſe Vines; the Ground, we plant them upon

cannot

cannot be worth above twenty Shillings *per* Acre, to reckon it at the higheſt; for the Side of a Hill, rocky, or Chalk, or Gravel, or indeed any dry Soil will do, as I have before mentioned; and then there will be no Expence for dunging or manuring the Land, as may be found in my new Improvements, *&c.* in the Chapter of Vines: Only to a Vineyard, there muſt be allow'd an underſtanding Man, to prune, and direct, whoſe Wages, I ſuppoſe 20, or 25 *l. per Annum*, and in a Vineyard of ſix Acres, he cannot have leſs than two or three Men under him to do the labouring Work at the proper Seaſons; but as Labourers have different Wages in different Countries, I ſhall not pretend to ſet their Price, no more than the Rates of Wines which for this Uſe, I find are about twelve or fourteen Sorts, ſome of which, bear much more Juice in Proportion to the Bunches they are preſs'd from, than thoſe I have mention'd. While I am writing this, a Gentleman who does me the Honour of a Viſit, thinks the Wages of the Gardener who is to be employ'd as Maſter of the Vineyard, too much; but in anſwer to that, I only ſay, that if I expect Succeſs in any Work where an Artiſt ſhould be employed, I would always chuſe a good one, and ſuch an one will very well merit good Wages, becauſe 'tis from his real Judgment, that the Maſter will receive profit;

whereas

whereas on the other Hand, if we employ a Man of no Underſtanding, who may always be diſcover'd by his pretending to know every thing; though ſuch a Man will ſerve us for nothing, we ſhall be Loſers by him; for unguided Management in a Garden, brings all to Confuſion, and robs us of that Pleaſure which would be every Way profitable to us. However, as the Pruning of Vines for Vineyards has not fallen into every one's Way to ſee the Method of, I have prevail'd upon Mr. *Fairchild* to put about eight or ten Sorts of Vineyard Grapes into proper Order, for an Example to thoſe who are curious to ſee and obſerve the Manner of the Vineyard Management.

In this Calculation, I have been as moderate as poſſible in my Account of the Profits, and have given ſeveral Allowances on that Side, which perhaps I need not have given, and though I have had an Objection made to the Wages I give the Artiſt for being too much, yet conſidering what Expence and Study an Artiſt requires to perfect him in his Art, as well as that he muſt be born with a ſovereign Genius, which no Man can give; ſurely the Man, who by his ſuperiour Power of thinking, which is the Reſult of all theſe, ought not to be upon the common Level of a Labourer; I don't ſay this, to create Pride or Self-Conceit in the Perſons I am

ſpeak-

ſpeaking of, for if they ſhould happen to be ſo weak as once to fall into that Snare, they will immediately place themſelves in the Rank of thoſe who ought to be their Labourers; but 'tis for the Advancement of Art I do it, which notwithſtanding the Policy of the *Engliſh*, is not every Day promoted or encourag'd. In the Management of Vineyards, it has been generally thought, that the *French* are infallible in that Particular, but it is an Error which I believe a little Reaſon will ſet to Rights. In the firſt Place we are to conſider, that all who profeſs Gardening with us, are not Men of the ſame Judgment; ſome will improve a Garden, while others will deſtroy it; and there are too many of the laſt Sort: Juſt ſo it is with the Vine-Dreſſers in *France*, where there is one that underſtands his Buſineſs, there are twenty that know nothing of the Matter; neither is it every Province in *France*, that has Vineyards, nor are all the People there Vine-Dreſſers, no more than all the People in *England* Profeſſors of Gardening; therefore it would be very unreaſonable to conclude, that every *Frenchman* of Courſe muſt underſtand the Management of a Vine, becauſe there are Vineyards in *France*; as well as to think that every *Engliſhman* muſt underſtand a Garden or an Apple-Orchard, becauſe we have Gardens and Orchards in *England*: And then again,

in

in the making of Wine in *France*, there are as many different Ways of Management, as there are different Ways of making Cyder in *England*; ſo that unleſs one could know which would be the moſt agreeable, I think better to paſs by giving any ſingle Receipt, for to give them all would be an endleſs Piece of Work.

It may be objected perhaps, that the Wine made in *England*, may not always be worth 10 *l. per* Hogſhead, though that at *Bath*, has been ſold for that Price; but if it was only to be ſold for Half as much, I think there would be little Reaſon to complain of the Improvement, and the Charge of Vaults, Wine-Preſs, and Caſks, might ſtill very well be paid out of it; or if the Wine was thought too ſmall, the beſt Brandy is always made of ſuch Grapes as produce ſmall Wine, as is very well known to moſt People of Curioſity, that have been in *France*.

As for rich Wines indeed, ſuch as the *Tokay*, *Muſcadell*, *Frontigniac*, and ſome others; I would not propoſe the making them in *England*, without the Benefit of Walls, for they will not ripen in the open Ground; but it is certain, for eating Grapes, I have hardly taſted better in any Part of *Europe*, where I have been, than of theſe Sorts at Mr. *Fairchild*'s Garden, which had only the Benefit of common Walls to ripen them; ſo that whoever has an Opportunity

tunity to give them that Aſſiſtance, may undoubtedly make good Wines from them; and truly, conſidering the vaſt Quantity of Juice they contain, and the Richneſs of the Wine they may produce, I know not but they might pay the Landlord very well.

Of the Caper, and the Manner of pickling it.

V. AS I am the firſt who have made the Caper familiar with our Climate, I think it neceſſary to give my Reader a Word or two concerning it, which yet I have not mention'd in any of my Works, and that eſpecially relating to the Method of gathering the Capers, and the pickling them for Uſe. I have ſaid before that the Capers which we eat are the Bloſſoms of the Caper-Buſh before they open, or the Flower buds of the Caper, theſe grow along the Shoots of the Plant, and would be very tedious to gather Bud by Bud, but their Way is to ſtrip them off the Twigs, Leaves and all, and ſift them thro' an open Sieve, which lets only the Bloſſom Buds paſs; when this is done, we let the

the Buds lie a Day or two in Heaps, and then putting them into very ſharp Vinegar, let them remain in it eight or nine Days, and after this, ſhift the Buds into another Veſſel of freſh Vinegar, to ſteep as before, and they will then be fit for Uſe. Mr. *Fairchild* has ſent for a Quantity of the Seeds of this Plant, ſo that I hope a few Years will give us Plenty of Capers of our own Growth.

Of an extraordinary Caſcade of Water, which will repreſent Flaſhes of Lightning

VI. IN Diſcourſe the laſt Year with a Gentleman of *Oxford*, concerning the Embelliſhments proper for Gardens, he informed me of a Curioſity in Water-Works, which I think muſt be very diverting, and particularly, if we ſhould once come to follow the *French* Faſhion of illuminating Woods and Gardens for Aſſemblies of Balls, it is to have a Water-Fall in Sheets over an Arch, and by placing Candles or Torches within the Arch, the Daſhing of the Water appears like Flaſhes of Fire, which muſt have ſuch an extraordinary Effect,

Effect, as I cannot paſs over without Notice.

Some Thoughts concerning the Preſervation of Timber.

VII. THE general Complaint of the Decay of Timber in *Great Britain*, notwithſtanding ſeveral Acts of Parliament have been made for the Preſervation of it, has led me to bend my Studies more particularly to the Improvement of that uſeful and neceſſary Commodity.

I obſerve, that where Woods are cut down, there are not always left a ſufficient Number of Standils, or young Timber-Plants to grow up in their Room, as an Act of Q. *Elizabeth* directs; and in other Places where there happens to be a due Number left ſtanding, thoſe are cut down as ſoon as they become of any ſmall Uſe, and others which are no better than Twigs, are left to ſupply their Place; and this Method being as I am inform'd, practis'd Time after Time, is one Reaſon why Timber decays, and our future Hope of it is loſt.

It

It is likewiſe obſervable, that young thriving Trees are frequently cut down by the Rabble, notwithſtanding the Penalties to be inflicted upon the Aggreſſors, directed in ſome late Acts of Parliament; but we do not find any of theſe Perſons ever convicted of their Crimes, and therefore the Evil ſtill continues; the Parties concern'd will not arraign one another, they wink at each others Faults, and ſo the Timber is ſtill deſtroy'd.

From hence I conceive, there can be no other Way propos'd for the Improvement and Preſervation of Timber, than to make it the Intereſt of every one to plant and preſerve it, and that I hope to do in the following Articles.

The Poor firſt, who make the greateſt Body in the Nation, are, through their Neceſſities, driven ſometimes to make free with their Landlord's Woods and Coppices for Fire-Wood, without being ſenſible of the Damage they do in cutting down the young thriving Plants or ſprouting Trees in the Vigour of their Growth, to make them become Pollards; theſe People, as they have no Trees of their own, cannot be ſuppos'd capable of judging any further of the Deſtruction they make, than barely that what they take is of no more Value than the Price of a common Faggot, or the ſame Quantity of Wood ſold in the Market, though perhaps the Damage done

to the Owner of the Wood may be five hundred times as much, for one may ſpoil twenty young thriving Trees to make up a Faggot of a Penny Value.

I have obſerv'd in my Travels about *England*, that in many Places Wood is ſo ſcarce that Firing is of more Value than Bread; though here are large Commons, yet the Country People have got a Notion that the Ground is barren, and will not bear Wood of any Sort, but as we are aſſur'd by Experience, that there is no ſuch Ground in *England*, and that every Sort how ſurly ſoever, will naturally nouriſh ſome Tree or other; ſo it would be for the Intereſt of the People inhabiting ſuch Places, to lay up a Parcel of their common Land for Wood, one Part for Firing, and another for Timber, which ſhould be wholly for the Uſe of the Commoners, or Poor, and another Parcel for the ſole Uſe of the Lord of the Mannor; unleſs where it is a Foreſt Land, and ſuch Places where the King has a Right of Timber, and in ſuch Caſe, the King's Part ſhould be planted with the reſt, without Expence to his Majeſty.

There is a Piece of Ground which has a promiſing Crop of Oaks upon it, near *Oxford*, which are ſo well guarded with Furze, that Cattle are turn'd into it, and do the Crop of Oaks no Harm; nor is there any Neceſſity of weeding the tender Plants, they

they thrive better without it; though it was once a Paradox to me, that Plants could be crouded together, without injuring one another; but it is now plain, that Plants of different Tribes, draw not only different Sorts of Food from the Earth, but ſhelter one another from hard Weather; ſo by this Method we ſave the Expence of fencing in our Plantations, and weeding them, which has been hitherto reckoned the greateſt Part of the Expence; and beſides this, we have in three or four Years a Crop of Furze, which will be fit for the Poor to begin with while their more profitable Crop is growing, either for Pollard or Timber-Trees; and the Furze only, will have no ſmall Welcome in ſome Parts of *England*, where Firing is ſo ſcarce, that even the common Weed call'd Ragweed is cut and dry'd for Firing. It is to be underſtood, that the greateſt Part of theſe Woods are to be rais'd from Maſt or Seeds, which ſtill contributes to leſſen the Expence.

And that every Attempt of this Kind may prove ſucceſsful, I think there ſhould be a proper Officer appointed to examine the Soil, and allot for it the Sort of Tree that would grow beſt in it, and with the Juſtices of the Peace, or proper Inhabitants in each Place, appoint the ſeveral Parcels of Land for ſuch Purpoſe; and if neceſſary, a ſmall Rate made in ſuch

Pariſh for defraying the Expence, rather than to let the Poor give any thing towards it.

I ſuppoſe when this is done, it will be as well the Intereſt of one, as the other of the Commoners in the Pariſh, as well as Lord of the Mannor, to preſerve the Plantations from any Damage or Inſult, and all together will take Care of the King's Part, which might be ſo ſettled, that in Caſe there could not be found a certain Number of Trees in Proſperity for the King's Uſe, the Pariſh ſhould be oblig'd to make them good in Money; and ſo the ſame to the Lords of Mannors, in Caſe their Number, *&c.* of Trees were deficient.

By this Means I conclude that the Country may be ſtor'd with Timber and Fire-Wood, the Poor benefited, the Eſtates of the Gentry improv'd, and the Crown enrich'd, without Expence or Trouble to the Publick.

As for the Improvement of private Eſtates, Mr. *John Clarke*, an eminent Merchant, tells me, that in all the Leaſes he grants to his Tenants, he has a Clauſe to oblige the Tenant to plant a certain Number of Trees yearly, or at the End of 21 Years to pay him 20 *s.* for every one that is wanting, by which the Tenant is neceſſarily made the Guardian of his Plantation, and will plant and preſerve his Trees more

 effectually

effectually than any Servant upon Hire will take the Pains to do.

It may not be improper to hint, that where we have large Tracts of Ground which are over-run with Furze, we might in ſuch Places, employ People to plant Acorns juſt under the green Part of the Furze, or near the Roots of them, that when they come up the Cattle may not annoy them; the Perſons whoſe Property that Land is, will certainly find their Advantage by it.

Obſervations on the Management of the Anana or Pine-Apple, ſince Mr. Telende's *Method was publiſh'd, and of the extraordinary Growth of the Senſitive Plant, Humble Plant, and others from the warmer Parts of the* Weſt-Indies.

SINCE I publiſh'd Mr. *Telende*'s Account of managing the Pine-Apples, I find that his extraordinary Succeſs has encourag'd a great many to undertake the Culture of that delicious Fruit; and tho'

the Stoves which have been built by ſeveral Gentlemen for that Purpoſe, vary in ſome little Matters from the Stove at Sir *Matthew Decker's* at *Richmond:* Yet I do not find any of them that have been try'd, but what produce ſome extraordinary Effect or other, which leads us more into the Knowledge of the Humour of that curious Plant, as well as others which are Natives of the ſame Climate.

The new Frame at the Phyſick Garden at *Chelſea*, wherein only the Uſe of the Tanners Bark has been try'd this Summer 1723, by Mr. *Miller* the curious Gardener there; is an Inſtance, that it is not impoſſible to bring Plants of the Latitude of 18 or 20 Degrees to the utmoſt Perfection. About the Beginning of *Auguſt*, I obſerv'd the Senſitive Plants there about ſeven Foot high in Bloſſom, and the Humble Plants were then preparing to put forth their Flowers. The Plants call'd the Flower Fence, ſo much eſteem'd in *Jamaica* for the Beauty of its Bloſſoms, and ſome others of the ſame Country, are ſaid to be in greater Strength than they were obſerv'd in *Jamaica*, conſidering the Time of their Growth from Seed, which were put in the Ground the Spring of the ſame Year; ſo that now I hope my former Conjectures and Deſigns, will be rewarded in ſeeing all the moſt excellent of the *Indian* Fruits brought to Per-

Perfection in *England*; for where ſuch is the Succeſs of a Frame deſign'd for Summer Uſe, I have no Room to deſpair.

But as for the Pine-Apples, which I deſign more particularly to treat of in this Place; we have Inſtances of their being brought to extraordinary Perfection at the Garden of the Right Honourable *Spencer Compton*, Eſq; Speaker of the Houſe of Commons, at *Chiſwick*; and at that curious Gentleman's Mr. *John Warner*'s at *Rotherhith*; whom I had formerly Occaſion to mention on Account of his excellent Vineyard: There are ſeveral Stoves now built by curious Gentlemen on this Account; but as they have not yet been prov'd, I ſhall forbear to mention them particularly, only to take Notice, that that which was erected this Summer in the Gardens of *William Parker*, Eſq; near *Croydon* in *Surrey*, commands the Admiration of all the Judges that have ſeen it, for juſt Achitecture, and good Contrivance; the Deſign of it, beſides the keeping of tender Plants during the Rigour of our Winters, and the reſtoring of ſick Plants which is common to moſt Stoves, is likewiſe to ripen ſome Fruits which have been ripen'd in other Stoves here, as well as in *Holland*, and to make new Experiments on others that have not been try'd; 'tis therefore endeavour'd to make this Stove capable of being heated differently in dif-

ferent Parts of it, in Order to imitate in ſome Sort different Climates, which may be regulated according to different Heights of the Thermometer: For theſe Purpoſes it is ſo contriv'd, that in the Summer Time it may be uſeful by Means of Tanners Bark only, and in the Winter, both Tanners Bark and Fire may be us'd together, or Fire alone.

I obſerve in a Stove which Mr. *Fairchild* has built this Year in his Garden at *Hoxton*, for Pine-Apples, and the moſt tender Plants; that he has rais'd his Fire Flues above the Surface of the Floor of the Stove, which carries very good Reaſon along with it; for firſt as theſe Flues are not bury'd in the Earth, there is no Danger of their raiſing Damps in the Houſe; but on the contrary, if any Damps would riſe there by any other Means, the dry Heat which will proceed from ſuch Flues, will rectify it, and render it fit for Plants, by quickening its Motion; for the more rarify'd is any Fluid, the quicker it is in its Motion; ſo the leſs rarify'd is ſo much ſlower, or nearer Stagnation, and may become ſo denſe by extream Cold, as to have no Motion at all, and become entirely fix'd; and the Juices of a Plant are always more or leſs fluid, as the Temper of the Air is more or leſs hot or cold or dry or moiſt; the Particles of Air are quicker in their Motion than the Parts of Water; and

and yet the Air of our Atmoſphere, is no more than the refin'd Parts of Water rarify'd by Heat, which upon meeting with Cold, are condens'd in ſuch Manner as to be again reſolv'd into Water; and this Water again, by more extream Cold is fix'd in Ice; but then from that fix'd State, it may again be reſolv'd into its firſt Condition by Heat: And this I think ſhould be particularly conſider'd by every Gardener; for unleſs he can judge well of the State of Air, and how to correct or change it from one State to another, he can never work in this Way with any Certainty. And for the better pointing out to every one, the exact Degree of Heat, neceſſary to be obſerv'd in a Stove, for maintaining of the Pine-Apple, it is, that the Thermometer is ſo ſerviceable to us; but I do not mean thoſe which we meet with at every Place, for they are by no Means to be truſted, unleſs they were all regulated by one Standard: For I have ſeen in one Place, above 40 Degrees Difference in ſome Thermometers with printed Scales, at the very ſame Time, ſo that no right Judgment could be made from any of them; nor perhaps ſhould we have rectify'd this Error, if it had not been for Mr. *Telende*'s Succeſs in raiſing the Pine-Apple, who mark'd his principal Point of Heat on a Thermometer which he had in his Stove;

and

and by which he has regulated his Heat ever ſince, and from thence, and ſeveral new Obſervations made by the Curious, we are now furniſh'd with uſeful Thermometers of one Standard, carefully regulated by the ingenious Mr. *Fowler*, Mathematical Inſtrument Maker in *Swithin*'s Alley near the *Royal Exchange*. As the Degree of Heat by this Means may be always known; ſo we are next to obſerve what is chiefly the Caſe of the Bark Heat, *i. e.* the Heat occaſion'd by Tanners Bark, which has not been touch'd upon before in any of my Works.

In the Beds of Tanners Bark that are made for the Winter, I find that all the Heat they produce is confin'd within themſelves, they yield no perceptible Warmth above their Surface, as the hot Beds do that are made of Horſe Dung; ſo that they are capable only of warming the Roots of Plants, whoſe Pots are plung'd into them; and therefore ſhould always have an artificial Heat by Fire, to warm the Air above, for elſe the tender Plants that are plung'd in the Bark in the Winter Time, will rather miſcarry than come to good; for it is not to be ſuppos'd that the Growth of the Root can be advantageous to the Plant above Ground, when the cold Air keeps the Juices in the Veſſels of the Branches and Leaves in a frozen Poſture; ſo that they cannot move, tho' the Vegetation of the

the Root puſhes with never ſo great a Force; and it is certainly the Caſe where there is only Heat below, and none above, as Experience ſhews us, that Plants languiſh: As there is not Sun enough in the Winter to keep the Juices above Ground in Motion, ſo without the Help of Fire for that Purpoſe, they will not thrive; but where theſe two concur, (I mean the Heat below, and the Heat above) then Plants do not fail of Succeſs, even of ſuch as is very ſurprizing; witneſs what I have ſaid before of the *Weſt-Indian* Plants, under Mr. *Miller*'s Care at *Chelſea* Phyſick-Garden, which have been cultivated from the Spring to *September*, only by the Aſſiſtance of the Tanners Bark, and the Summer's Sun.

We are next to conſider in what other Circumſtances the hot Beds of Tanners Bark and Horſe Dung differ from one another. *Firſt*, from the Obſervations I have made ever ſince I began with Gardening; I never knew the greateſt Artiſt in the Management of the hot Beds made with Horſe Dung, raiſe the Senſitive Plants above two Foot high in one Summer, nor any of the other *Weſt-Indian* Plants above a fourth Part ſo tall as they are at *Chelſea*, and ſome other Places in the Beds of Tanners Bark; and this may be for two Reaſons, the one becauſe the Heat in the Bark is moderate, gentle, and of long Laſt;

Laſt; and the other, becauſe it is likely the Bark partaking of a large Share of Richneſs from one of the ſtrongeſt Vegetables, the Oak, and from one of the ſtrongeſt Animals, the Ox: I ſay theſe two powerful Ingredients fermenting gently in the Bark, may be a Means of nouriſhing the Plants, whoſe Roots are plung'd into it; for tho' the Roots are in the Pots, yet we are aſſur'd, that either ſuch Nouriſhment may be receiv'd by the Holes at the Bottom of the Pots, or elſe the Moiſture in the Body of the Bark, may eaſily be imbib'd by the Earth, of which, the Pot is compos'd, which every one knows is porous enough to receive any Humidity or Moiſture; if this be ſo, then the Roots may have as much Nouriſhment as they want; for as I ſay'd before, there is nothing evaporates from this Body of Bark that is in the leaſt to be diſcover'd, ſo that the Roots have all the Benefit of this Richneſs to themſelves: Now, where ſo much Nouriſhment is receiv'd by the Roots or Mouths of a Body, it is neceſſary in Nature, that there ſhould be ſome Diſcharge either by the Growth of the Body, which is by explaining the Parts of a Plant, or filling the Veſſels fuller of Juices; or elſe ſome other Way, which will happen as the Temper of Air is, where the ſame Body reſides; ſo is it neceſſary to conſult

the

the Quality of the Air, as well as the Dyet of a Plant for its Welfare.

But when we have paſs'd this Conſideration, we may conſider a little more of the Building: I ſhall only ſay that in the Frames which are now built for the tender *Weſt-Indian* Plants; there is near ten Times as much Air inclos'd in the Summer Time, where nothing but Bark is us'd, as I have mention'd in Mr. *Telende*'s Account, and yet the Pine-Apples are in extraordinary Health. It therefore depends very much upon the Workman who builds the Frame or Stove, to underſtand what he is about; and particularly how to diſpoſe the Fire-place and Flues, to know how to provide the proper Regulators for the Heat, and the Quantity of Space ſuch a Place ſhould fill; beſides, the Particular of diſpoſing the Glaſſes in the Front, which adds extreamly to the Welfare of a Plant; and this Want of Knowledge being the frequent Occaſion of Miſcarriages, I think my ſelf oblig'd to inform the Curious, that Mr. *George Eden*, at the *Bricklayers-Arms* in *Miles*'s-*Lane* near the *Monument*, is a Workman of extraordinary Capacity in theſe Affairs; having built ſeveral Stoves and Frames for this Uſe, after the moſt conſiderate Deſigns of the Curious; and indeed there is ſo much Nicety requir'd in the diſpoſing of the Fire Flues in the Walls and other Parts,

that

that it is very neceſſary to employ an underſtanding Workman: As for the Deſign of a Stove of this Sort, I have prevail'd with Mr. *Rogers* of *Shoe-Lane*, a very ingenious Architect, to compoſe a Draught agreeable to the Uſe requir'd, and to the Rules of Architecture, which I ſhall here preſent my Reader with.

It is neceſſary to obſerve by the by, that the Uſe of the Thermometer is chiefly in the Winter; when we make our Fires, or give artificial Heats, then we are to keep the Spirit up to Pine-Apple Heat, or thereabouts, rather above than under that Point; but in the Summer Time the natural Heat of the Sun when it is confin'd in a Frame, will be ſo much, that the Spirit would be up at the Top of the Tube; but yet, that Heat in Summer with the Addition of the Tanners Bark to the Roots, is no more than neceſſary for the ripening of the Fruit, as the artificial Heat in the Winter is neceſſary for the Growth of the Plants.

For the Uſe of ſuch as may propoſe the propagating, or Culture of the Pine-Apple in more ſouthern Parts; the neceſſary Directions are given in the following Letter, which I drew up on Purpoſe for Mr. *John Clark*, an eminent Merchant at *Oporto*; which with that ingenious Gentleman's Anſwer to it, may be of good Uſe to help our Obſervations, and teach us to judge

judge of the Difference of Climates; and that the Management of a Plant in one Climate, ſhould be different from the Management of it in another Latitude.

To Mr. John Clark, *Merchant*, Oporto.

London, Jan. 28, 172$\frac{8}{9}$.

SIR,

THE worthy Gentleman your Father acquaints me, that you have a Deſign of propagating the Anana or Pine-Apple in *Portugal*; the Method of doing which with us you will find in a monthly Book, publiſh'd by me; and which I ſuppoſe Mr. *Clark* has ſent you. But as your Climate has much the Advantage of ours in ripening Fruit of any Sort, ſo you muſt ſurely have extraordinary Succeſs, tho' there muſt be ſome Alteration in the Way of Management.

In the firſt Place, your Sun is ſo hot in the Summer Months, that the Glaſſes of your hot Bed Frames would ſcorch and burn your Plants, if they were to be cover'd in the hot Time of the Day; therefore I rather recommend Frames of Canvas to cover the Plants in the Times of the Sun's great Heats, and the Glaſſes only to be put

put over the Plants about an Hour before Sun ſet, to cover them a Nights, and keep a Body of warm Air in the Frame, till the Warmth of the following Day approaches; ſo likewiſe in your hot Weather, the Plants will require more frequent Waterings than with us, but not more at a Time than we would allow them in our Climate.

Your Seaſon of Spring, I ſuppoſe is about ſix Weeks before us, and as much good Time for ripening of Fruits after us: But I would gladly know from you, how far I am right in my Conjectures concerning your Spring and Autumn Seaſons; and alſo when your great Rains fall, which will help to inform us how to cultivate Plants that come from the Country where you are.

We have got a Thermometer for you, whereby your Heats may be regulated; but it is rather to direct your artificial Heat in Winter than in Summer; for your Summer Heats will fling the Spirit ſo very high in the Glaſs, that 'twill be beyond Regulation; and as the Summer Sun is a natural Heat, ſo it needs not be any otherwiſe regarded, than by keeping it from ſcorching the Plants. But I ſhall ſpeak a little more fully of the Uſe of this Thermometer, which I have chiefly contriv'd for the Uſe of Plants; and yours is the firſt that has been finiſh'd.

This

This Inſtrument ſhews the Degrees of Heat or warm Air neceſſary for Plants which grow near the Equinoctial Line, and from thence is mark'd upon the Scale the ſeveral Degrees or Proportions of warm Air requir'd for Plants which are Natives of Climates in ſeveral Degrees of Latitude, as far as 40, which is as much or more than we have Occaſion to uſe in or about the Latitude of *London*, which is 51 Deg. 30 Min. for we find by Experience, that the Plants of *Virginia*, whoſe Latitude in the moſt Northern Point, is about 38 Degrees, will live abroad, and defend themſelves againſt the Rigour of our Froſts. So likewiſe we have many Examples of Plants from the North of *Carolina*, whoſe Latitude is about 34 Degrees, that will generally bear our Winters without Shelter. But from about 34 Degrees to about 26 or 27 Degrees, we muſt Shelter them every Winter in a common Green-houſe, ſo that no Froſt may invade them.

After this, as we come nearer to the Tropicks, or the Line, we muſt be diligent to give the Plants the ſeveral Degrees of Watering natural to the reſpective Climates; and for that End we ſhould learn when the Seaſons are that the Rains fall in Countries of different Latitudes. Nor ſhould we too inadvertently attempt to harden Plants, but rather ſeek

to increaſe their Strength by making them grow and increaſe in their Bodies; for in the common Way of making them hardy, though they yet live with us, they loſe their natural Intent of bearing Fruit, and ſo become uſeleſs.

In the Culture of Plants therefore, it is not enough only to give them ſuch a Share of Warmth, or Shelter, as will barely keep them alive; but we muſt give them ſuch Heat at proper Seaſons, as may equal, if poſſible, that of their native Country, which in a particular Manner ſhould be regarded in the Culture of ſuch Plants as grow between the Tropics; but that has remain'd an Uncertainty, 'till Mr. *Telende*, Gardener to Sir *Matthew Decker* at *Richmond* in *Surry*, luckily diſcover'd the Degree of warm Air in *Nevis* and *St. Chriſtopher's*, where the Pine-Apples chiefly delight themſelves, even ſo juſtly, as to bring that delicious Fruit to Perfection with us; and as they ſucceed under the Influence of the Heat he gives them, ſo we may be ſure every other Plant growing in the ſame Degree of Latitude, may be made to proſper with us, whether they come from the North or South Side of the Line.

It is neceſſary likewiſe to obſerve the Courſe of the Sun, in the Culture of Plants which come from any of thoſe Latitudes mark'd in the Thermometer,

and

and apply to them the ſtrongeſt Heats of their reſpective Countries, at the Time when the Sun is neareſt thoſe Places which they were brought from; and when we receive Plants from Countries where the Sun paſſes over twice in a Year, our artificial Heats ſhould at ſuch Times be chiefly ſupported.

Thus, Sir, I have mention'd what I think will be neceſſary for your Uſe at this Time, with regard to the Thermometer; but when I know the State of your Climate, can ſay more: In the mean while, tho' I am unknown to your Perſon, I am no Stranger to your Merits, and conclude,

Your moſt Humble Servant

To Command,

Richard Bradley.

Mr. Clarke *of* Oporto's *Answer to the foregoing Letter.*

To Mr. Bradley, *F. R. S.* London.

S. I. R. *Oporto, April* 16, 1723.

I Am extremely obliged to you for your Favour of the 28th of *January*, and the Advice you give me concerning the Culture of the Anana's: I have had much Trouble to preſerve the two Plants my Father ſent me, through the little Care Maſters of Ships generally take in bringing Plants, and beſides, I have had a violent Fit of Sickneſs for three Months paſt, ſo that I have not had the Opportunity to mind their Propagation ſo well as to expect Fruit from them this Seaſon, but am fully bent upon all Diligence for to have it the next.

The Anana is a Plant very common in the *Portugueze* Colonies in *Brazil*, that few Sea-faring Perſons and Factors and have been there, are unacquainted with it.

Doubtleſs,

Doubtleſs, the Thermometer you have contriv'd, to ſhew the proper Degrees of Heat natural to each Plant, will render their Culture prodigiouſly eaſy; I impatiently expect that which you have been pleaſed to finiſh me, for which I give you my hearty Thanks.

We are ſituated here within a League of the Sea, in a Hilly, Rocky Country; few Grounds are improv'd, but what are humid, or elſe have little Springs of Water near them, to moiſten in Summer Time. In our Wine Country, which is about Sixty Miles diſtant, Eaſtward, the Heat and Cold is more exceſſive than with us, by reaſon the Mountains are much higher and ſteeper. The Summer Weſtern Sea-Breezes do not reach that Country; and the Reverberation of the Sun from thoſe Rocky Hills, heat the Air to ſuch a Degree, that the Night in the Summer Seaſon is as hot as the Day.

We have our Spring ſooner about a Month than in your Climate, and the ſame Continuance of good Weather longer in Autumn. The Winter Air is very ſharp and piercing to Plants, tho' we feel little or no cold Weather; but I ſuppoſe the Reaſon is, that our Air is more ſubtle and not ſo condens'd as yours is. I have known in Winter a continual Rain for ſix Weeks, but ſome Years we eſcape without any. Our worſt Months are

from the Middle of *December* to the Middle of *February*; for in the latter End we reckon Spring begins.

I obſerv'd in one of your Monthly Papers, the Experiment of Cutting or Laying the Branches of a Tree in the Ground, and the next Seaſon raiſing the Roots into the Air, which will do the Office of the former Branches: It is the Practice here to do ſo in the Increaſe of the Fig-Tree, becauſe they find it very tedious before it will bear from Suckers: Their Method is laying the Top Boughs of any Branch into the Ground, and in the new Seaſon ſawing off the Branch, and ſtaking it as upright as poſſible; which Top Stump in the Air will ſhoot vigorouſly, and quickly give Fruit. I am told, that the *China* Orange may be uſed ſo, and then, they ſay, the Fruit of the new-made Tree is without Kernels.

A Fryar has promiſed to graff me this Seaſon the Carnation upon Fennel; he ſays, the Flower will be entirely green, as well as the Plant; and he aſſures me, the Colour will keep two or three Years the ſame, and after that, changes to the Colours common to that Flower: He adds, that in this Country the beſt Stock for graffing Stone Fruit upon, is the Peach, for its Flavour is communicated into the Fruit of the Graff; as likewiſe, if you graff a Peach upon a Mulberry, the Fruit will

will have the Purple Dye to the Stone, and the pleaſant acid Flavour. If I can make any Obſervations here worth your Notice, I ſhall communicate them to you with Pleaſure. The Natives are the leaſt curious in Gardening of any Nation in *Europe*: Any thing uncommon is in the Convents, where they ſeldom Part with it.

I am, Sir,

Your moſt Humble Servant,

John Clarke.

Conſiderations upon Captain Cumberland's *Invention for ſoftening and making Timber plyable, as it is practis'd in his Majeſty's Yard for Ship-building, whereby the moſt rude and crooked Timbers may be made ſtraight, or Planks of any thickneſs may be brought to the Bow.*

WHAT I have already mention'd in this Piece, relating to the Planting and Improvement of Timber, ſeems to command the following Obſervations concerning the Uſe of it.

Having lately, in a particular Manner, taken a Tour about ſeveral of the Roval Docks for building of Ships, as well as ſome more private ones, I had the Curioſity to obſerve the ingenious Contrivance of Captain *Cumberland*, for bending of Plank and Timber by Sand-heats, which he has now brought to ſo great a Perfection, that even Pieces of ten Inches thick, by two Foot broad, can be brought to any Bow in ſuch a Manner, as to preſerve all its primitive Strength; and alſo crooked and ſurly Sticks of Timber of far greater Bigneſs, made ſtraight by the ſame Means.

I believe it is pretty well known, that the Methods which have been uſed to bring Planks for Shipping, *&c.* to the Bow, has been done by burning, before the Captain's Invention took Place; and not only was that bending of Plank by burning, brought about by expenſive Firing, but by expenſive Attendance; and then, when all was done, the Strength of ſuch Planks was greatly impoveriſh'd, for by ſuch Burning, many of the binding Veſſels of the Wood were broken, and became of no Service. Again, I obſerv'd, that large Scantlings of Timber could not be brought to bend by burning, ſo that the Workmen in ſuch Caſes were forced to have recourſe to compaſs Timber, or to cutting out a Bow, or an Arch,

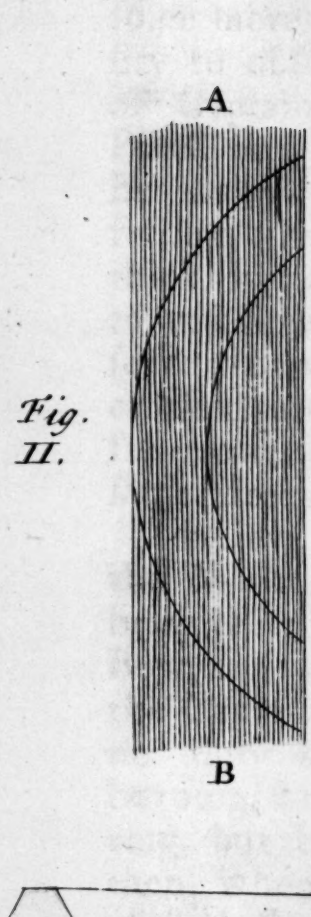


Fig. II.

Fig. III.

Fig. I.

out of a Solid Piece of Timber, at more than double the Expence it would have been if they could have bent a ſolid Piece to their Bow, of which the following Example is a Proof.

One Piece of Compaſs Timber containing 100 Foot, makes but one Harpin of ten Inches thick for a firſt Rate Man of War; but by Captain *Cumberland*'s Method, a Piece of ſtraight Timber, containing only 95 Foot, made two Harpins of the like Subſtance, and one Piece of 5 Inches thick for the ſaid Ship; which Difference is very conſiderable, if we conſider that the 100 Foot Compaſs-Timber, *i. e.* two Load, worth 3*l.* 10*s.* *per* Load, is 7*l.* for one Harpin; and that by the Captain's Method, we have two Harpins of the like Sort, beſides a Piece of 5 Inches, for 5*l.* 15*s.* or 95 Foot, after the Rate of 3*l.* *per* Load.

The bending of Timber by the Captain's Method of Sand-Heats, has yet this Advantage in it, that it ſeaſons the Timber, by exhaling or drawing from it all the watery or aqueous Parts, as is evident from the Sands being diſcolour'd, when the Timbers are come to a right bending State; and theſe watery Parts, every one knows, are the firſt Occaſion, as well of the rotting as of the ſhrinking of Timber; which laſt is in a particular Manner ſo well underſtood, that every one ſeeks for well

well ſeaſoned Timber, and is content to pay conſiderably more for it, as it prevents a ſecond Trouble in building, by rejoining of Parts, which in unſeaſon'd Planks or Boards, are apt to fly aſunder. Nor is this all the Good we are to expect from well ſeaſoned Timber, or Planks, or Boards; for beſides the exhaling of the Watery Parts, we preſerve the Reſinous or Gum-like Juices in the Wood, pure and unmix'd, which tend to preſerve the Wood, and prevent Rottenneſs.

One Thing which pleas'd me extremely in this Way was, the ſtraightning of a Piece of Timber 50 Foot long, which ſquared at the Butt about two Foot, and at the Top about 18 Inches. It was much like *Fig.* I. in Shape, but notwithſtanding its crooked Form, and its extraordinary Contents, when it was ſaw'd through lengthways, and had been put in the Sand-Heat, being then placed upon a flat Piece of Timber, and braced down with Ropes, was afterwards with Wedges brought to be perfectly ſtraight. This I think will be of great Uſe, conſidering how much of this uneven Timber we have in *England*, and how much has been cut to Loſs, for want of ſuch reconciling Means.

Since I have obſerved theſe Things, I cannot help taking Notice *en paſſant*, that this Way would be of extraordinary Uſe in building of *Cupola*'s, and every Thing where

where Compaſs Work is requir'd, and even in the making of Wheels; which laſt might have the Part call'd the Nave made of two Pieces only, this bended Timber carrying a great deal more Strength in it, than any that is cut out of ſolid Pieces; beſides what may be ſaved by this Means, which will be very conſiderable.

But that we may have the better Idea of what I ſay, relating to the ſuperiour Strength of the bended Timber, we may obſerve the following Particulars.

Firſt, That all Timber is compos'd of two Sorts of Veſſels, *viz.* thoſe which run lengthways through the Body of it, and others which are interwoven among them, of a more tender Nature, that run croſs-ways. The firſt are like thoſe Strings which remain in Flax or Hemp after they are dreſs'd, wherein is the Strength of the Plant; the other is compos'd of thoſe Veſſels which are beaten off, when the Hemp or Flax is pounded; and theſe two Sorts of Veſſels are found in all Plants whatever; ſo that the firſt Sort of Veſſels, *viz.* the long ones, are to be preſerv'd as much as poſſible for the Strength of Timber. The *Fig.* II. ſhews by many ſtraight Lines running from A to B, the long Veſſels which I ſpeak of, which as long as they remain entire, and together, are like the Bundle of Rods in the Fable, not to be broken; but let any one judge,

wher

when many of theſe Strings are cut, as appears by the Compaſs-work mark'd out between A and B. whether the Arch to be cut out of ſuch a Piece of Wood, would not be very weak, in Compariſon of a Piece of Wood bent as I have mention'd, or as we may obſerve in *Fig.* III. where we may ſee theſe Veſſels of Strength reaching quite through the Piece which is bent to an Arch; ſurely then, ſuch an Arch, when it does periſh, muſt decay all at once, becauſe all Parts are alike in Strength; and conſidering how much the Lives of great Numbers of Men depend upon the Strength of thoſe Ships they go to Sea in, the ſtrongeſt Way of building Ships is to be preferr'd. But there are two Objections to this bending of Timber; the firſt is, That it will not always ſtand bent to the Bow we firſt bring it to. But we find no Reaſon for ſuch an Objection, becauſe that we find large Pieces of ſuch bent Timber that have only been confin'd 'till they have been cold, have then had their Braces taken off, and they continu'd perfectly bent, as they were when they were braced without the leaſt Guard to keep them from flying out: The Reaſon is, becauſe, as I obſerv'd before, there remains only the Reſinous Juices in the Timber, after it is heated to the Purpoſe; ſo thoſe Juices, which harden extremely when the Wood comes to

be

be cold, cannot give Way again, 'till they are melted, or made fluid, by an Heat equal to that which diſpoſed the Timber firſt to be bent. 'Tis as if we were to dip a Piece of Rope in melted Rozin, which will bend while the Rozin is warm; but when once it is throughly cold, it becomes ſtiff and hard, and cannot be reſolved into its firſt Capacity of eaſy bending, 'till the Rozin is again warm'd, and becomes fluid.

The ſecond Objection is, That by bending of Timber, theſe Veſſels, which I ſay ſupport the Strength of it, are ſome ſtrain'd, and ſome broken, and that there are none of them left in the Strength they had before. If it were ſo, how is it then, that in laying down Branches of Trees in the Ground to take Root, which bend them much more than I have mention'd: How then does it happen, that theſe Branches grow in all their Parts, as well as they did before we bent them; or if we bend the young Twigs of a Tree ſo much as to tye them in Knots, even then they do not refrain their Growth; and it is every where allow'd, that the Veſſels we ſpeak of, convey Sap to every Part of the Tree, and if they were broken, the Current of the Sap muſt be ſtopp'd, and all Growth muſt ceaſe; ſo it is evident, theſe Veſſels are neither broken nor weaken'd.

I have

I have only to add, that of all the Experiments concerning the ſaving of Timber, and rightly applying it to Uſe, I know none which ever contributed ſo much to the good of our Country; for in the Affair of Ship-building only, where the bending of one Plank uſed to employ four or five Men an whole Day, beſides a great deal of Expence in Firing; by Captain *Cumberland*'s Method, 16 Planks can be bent in a Day by two Men, with leſs Expence of Firing than one ſingle Plank uſed to do before; beſides preſerving it of its full Thickneſs, and ſquare Edge, which is of very great Advantage in the Cauking of Ships.

To William Parker *of* Healing, *Eſq; concerning the Culture of Foreign Plants in* England.

SIR,

WHEN I had the Pleaſure of ſeeing your curious Garden at *Healing*, I obſerv'd ſo many foreign Plants which were naturalized to our Climate, that I could not help reflecting how uſeful an Example your Method might be to the Gentlemen of our Country, who above

above all others, have Opportunity of trading to foreign Parts, and eſpecially to *America*, where abundance of uſeful and profitable Trees and Plants are Natives. In *Mary-Land*, *Virginia*, and *Carolina* we have diſcover'd many Plants which the late Dutcheſs of *Beaufort*, the late Dr. *Compton* Biſhop of *London*, *Samuel Reynardſon*, Eſq; and ſome other Virtuoſi of the firſt Rank, made familiar to the *Engliſh* Climate; But hitherto no Gentleman has attempted to diſpoſe of ſo great Varieties of foreign Plants in the open Air, with ſo good Succeſs as you have done. I remember an Obſervation you was ſo kind to acquaint me with, which I think very extraordinary, *viz.* that among your Experiments in ſetting foreign Trees abroad in your Garden, you found that ſuch Plants as had Reſinous Juices, would bear our Winters, tho' they were Natives of much warmer Climates than any I have mention'd; and indeed there are Witneſſes enough in your Garden of that Sort. If we were to follow this Example rightly, I ſuppoſe in a few Yeats our Woods and Groves would be adorn'd with many rich and uſeful Trees, which at preſent, through the Fear we have of venturing ſuch Curioſities abroad, are hardly eſteem'd worthy our Notice, or at leaſt neglected as uſeleſs Things in our Climate; for tho' we can, with the great-

eſt

eſt facility preſerve them during the Winter Seaſon in Houſes, yet, as the *End* of the Trees I mean, is chiefly to make good Timber, or to yield ſome Benefit from their Berries, or Fruits, which they will not produce 'till they are of a much larger Size than we can manage in a Houſe; ſo it has been hardly thought worth our while to cultivate them at all, conſidering the great Expence we muſt be at to no purpoſe, but for the Sake of Curioſity only. I hope however, the Example you have now ſet us, will overcome theſe Difficulties. Indeed, that Houſes of Shelter are neceſſary to preſerve ſuch Plants during the Winters, for the firſt two or three Years, 'till they have got Strength, is undeniable; and as ſoon as they come to ſuch a State, as to be a little acquainted with our Climate by being harden'd by Degrees, to ſet them abroad in Groves as you have done, is as neceſſary; and they will then thrive apace, and give us not only the Pleaſure of obſerving their Variety, but alſo give us a promiſing Proſpect of receiving Benefit from them. The *Ilex*, tho' the Value of its Timber has for a long Time been well known, beſides its being a moſt beautiful Evergreen. Yet, tho' we have had Examples of 40 Years ſtanding, that it would proſper well in the open Air of our Climate, very few or none have offer'd to cultivate it in any Quantity

Quantity with us, 'till I enter'd upon it; and ſince that Time, which is within the Compaſs of ſix Years, many Millions of them have been raiſed here from Acorns brought from *Italy*, *Spain*, and *Virginia*, as well as great Numbers of *Cork* Trees, which grow very well with us. But if there are ſome Trees abroad, in the Climates I ſpeak of, whoſe Virtues are not yet known; my Opinion is, that even thoſe ſhould not be neglected; for as there was nothing created in vain, ſo I ſuppoſe that theſe will ſome Time or other diſcover themſelves to be of uſe, as well as thoſe have done which are now uſeful to us. The *Acer Majus*, or Great Maple, vulgarly call'd the Sycamore, has been eſteem'd of no uſe, 'till a very ingenious Gentleman, Mr. *Collinſon*, in his Travels through *Wales*, obſerv'd it grow well, and make an excellent Tree of Defence againſt the powerful Weſt Winds: But you will ſee more of it in his Letter to me, which I ſhall ſoon publiſh, with other curious Obſervations and Experiments. But ſince the Arrival of your Coffee-Trees, and the great Deſign you are carrying on, of bringing forward the delicious Fruits of the warmer Parts of the World, by Stoves, or Hot-houſes, I ſhall, in Obedience to your Commands, give you an Account of the Management of the Coffee-Trees, as I obſerv'd it at the

Phyſick-Garden at *Amſterdam*; and I ſhall add to it ſome Remarks I have got together concerning the Spring-Seaſons in the ſeveral Climates of the World, to ſave you the Trouble of calculating in particular for every Plant you receive from abroad; for without that be done, we may give our Plants Heat at a wrong Seaſon, and weaken them, perhaps, beyond recovery.

The Coffee-Trees at *Amſterdam*, which proſper ſo well there, that they bring Bloſſoms, and ripen Fruit every Year, are kept conſtantly in a Glaſs-Caſe, which, as near as I can gueſs, is about 15 Foot long, and about 12 Foot wide, the Height about 20 Foot, the Front is all Glaſs; under the Floor is an Oven for Fire, which leads into Flues; that after their Paſſage here and there, end in a Chimney as our other Stoves do. They uſe no Tanners Bark in this Houſe, nor give the Plants any Air all the Summer, but thro' little Caſements about a Foot ſquare, placed about the Middle of the great Windows or Pannels of Glaſs; and even theſe little Caſements are ſeldom open'd, becauſe there is a Door, which opens out of this Glaſs-Caſe into a large Green-houſe, which they commonly keep open in the Summer Time.

It is a Cuſtom there likewiſe, twice or thrice in a Summer to clean the Leaves of

Fig. II.

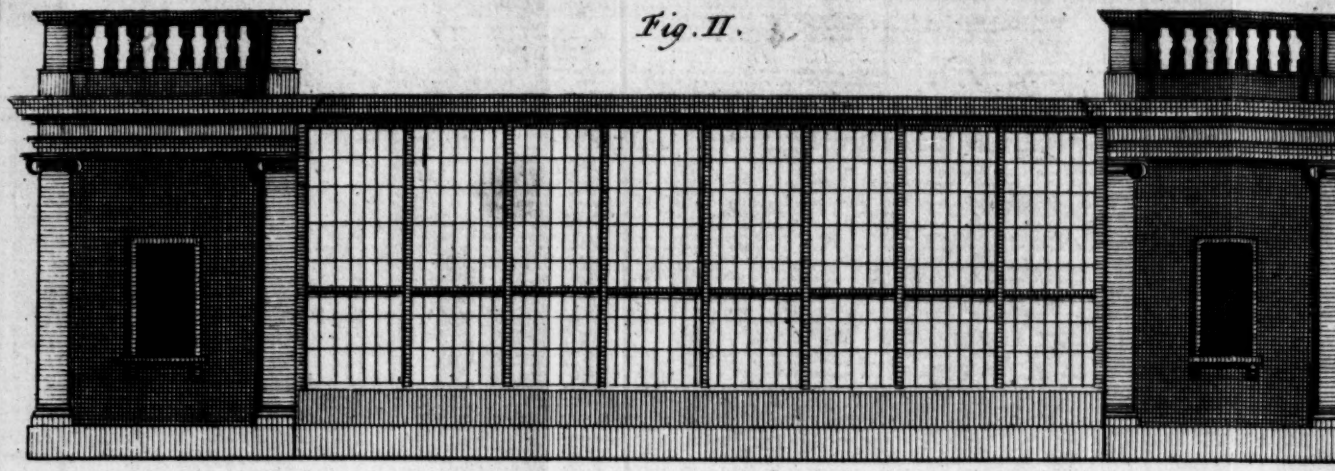
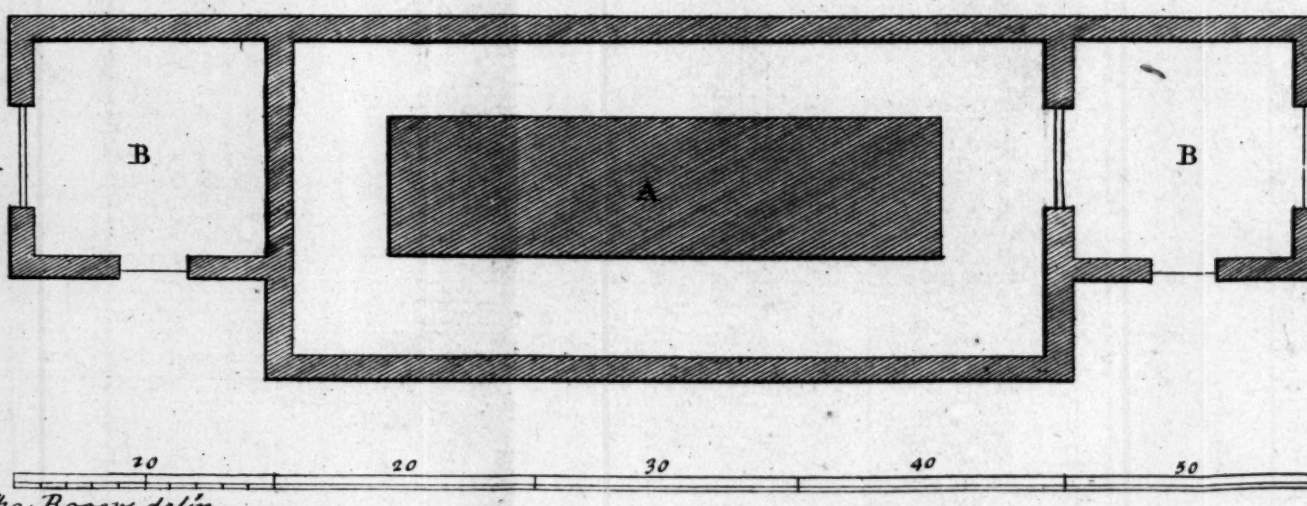


Fig. I.



10 20 30 40 50

Tho: Rogers delin.

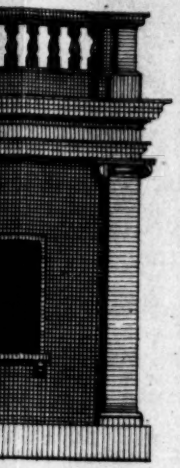


Fig. I. Is the Plan of a Stove with a Trench for the Tanners Bark, at each end is a Room 9 Feet by 8 Feet, that at the East end hath a Door out of it into the Stove, and serves the Gardner to lay his tools in, that on the West is where the Fire is kept. A the Trench, B. B. The 2 Rooms.

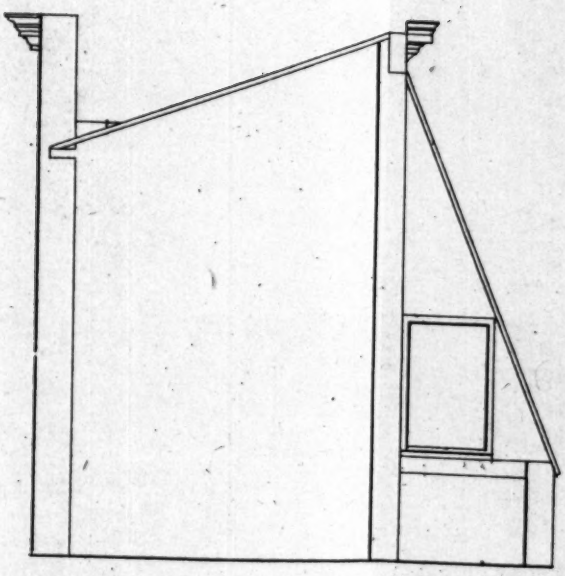
Fig. II. Is the Elevation of the Front in y^e^ Ionick Order w^th^. a Ballastrade on the top of each end.

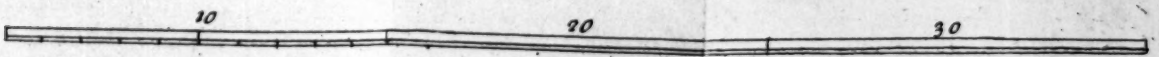
Fig. III. Shews the Elevation of the end.

Fig. IV. Is the Section of the end, which shews the true Elevation, the Glaß ought to have, there is a Window in the end.

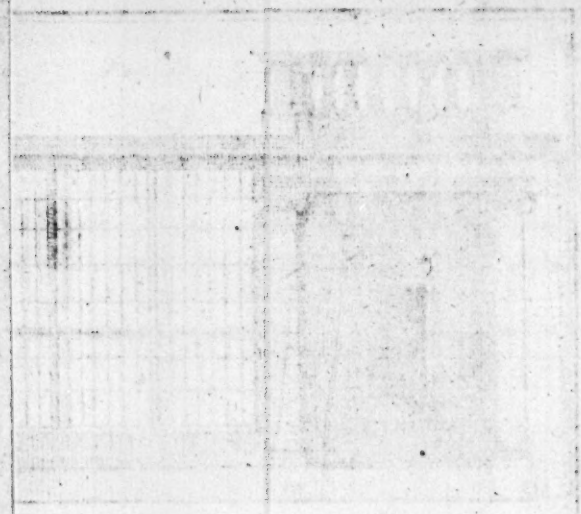
Fig. III.

Fig. IV.





J. Clark sculp.



of the Plants with wet Spunges, which takes off the Duſt that ſtops the Pores of the Leaves; and I look upon this to be of conſiderable Uſe, becauſe I ſuppoſe the Leaves receive ſome Nouriſhment from the Air, which circulates about them, and conſequently the whole Plant is benefited by it.

I obſerved that the Gardener there gave them frequent Waterings, a little at a Time, and their Earth was very light; but eſpecially the Summer when the green Fruit was toward ripening, he gave them more Water than at other Times, *i. e.* in *June*. It is obſervable, that when the Fruit is ripe about the Beginning of *July*, it muſt be gather'd, and immediately the Seeds muſt be clear'd from the Pulp, and ſet in the Ground, otherwiſe they will not ſprout: This particularly the Gardener at *Amſterdam*, Mr. *Cornelius*, obſerves diligently; and tho' I ſent ſome Berries freſh gather'd, by the Poſt, which were not above four Days in the Paſſage to *London*, to a very great Artiſt, they could not be made to grow; therefore, I think it much the beſt Way to have the Coffee-Seeds you expect, come over in Earth, by Way of *Rotterdam*, or *Helvoet-Sluis*, which will be much ſooner with you than by Way of the *Texel* from *Amſterdam*; for ſometimes I have known a Ship has been two Months in the Paſſage from *Amſter-*

dam to *London*, by Way of the *Texel*, and the Seeds would be quite ſpoil'd in that Time, for in the natural Earth only, I have ſeen ſome Coffee Plants above Ground within three Weeks after the Seed was put into the Ground. And ſo the Cocoa-Nuts, of which the Chocolate is made, ſhould be either raiſed in Caſes in the Countries where they grow, or elſe the Nuts planted in thoſe Places a due Depth in Boxes of Earth, ſo that they may come up in the Paſſage, if it is their Nature to be quickly hatch'd, or appear above Ground, or otherwiſe we muſt not expect them to do any good with us; for I am told, that in the very Country where they ripen, they will not grow if they are kept out of the Ground three or four Days after they are gather'd. What I ſay of the Coffee-Berries being ſpoil'd by being ſo ſo long in Earth as two Months from *Amſterdam* to *London*, will only happen if they were to be put promiſcuouſly into a Body of Earth, not if they were planted an Inch or two deep in it.

As for the Time of making the Fires in the Stoves, they begin in *October*, and continue it conſtantly, 'till the Weather is warm enough in the Spring for the Plant; I ſuppoſe this continu'd Fire in the Stoves is neceſſary to continue the Growth of the Plants, when the Juices are once flowing; for to warm the Houſe

one

one Day, and let it cool the next, will certainly check the Growth of a Plant; and this Method, which we have taken too often in our *Engliſh* Green-houſes, has, in my Opinion, greatly contributed to deſtroy many a good Plant. And then again, the Practice which has been ſo common with us, to ſet Plants of all Climates together in one Houſe, and give them all Heat at the ſame Time, has been another Means of deſtroying Plants; but as your Stove is contriv'd in ſuch a Manner, as to be ſeparated one Part from the other, by a Partition; ſo I judge, your Heat may be govern'd ſo as not to be every where at the ſame Time alike, and therefore may bring Plants of different Climates to perfection.

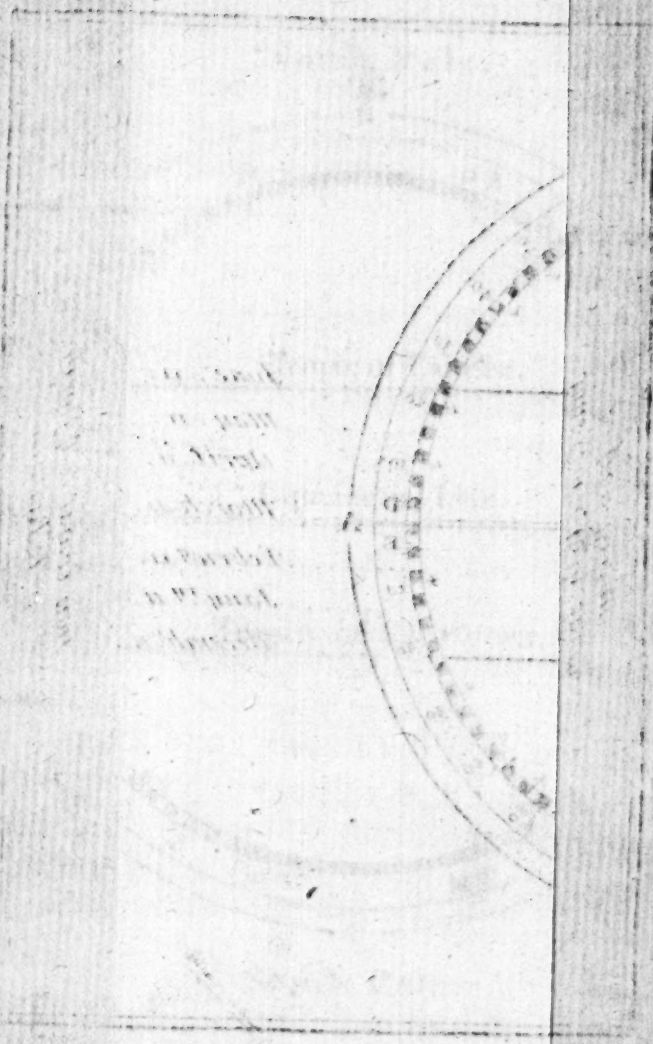
The Gardener of the *Amſterdam* Gardens ſeems to have ſome Regard to this, as I obſerve from his dividing his Stoves into many Parts; and I find in each, only the Plants which come from one Country.

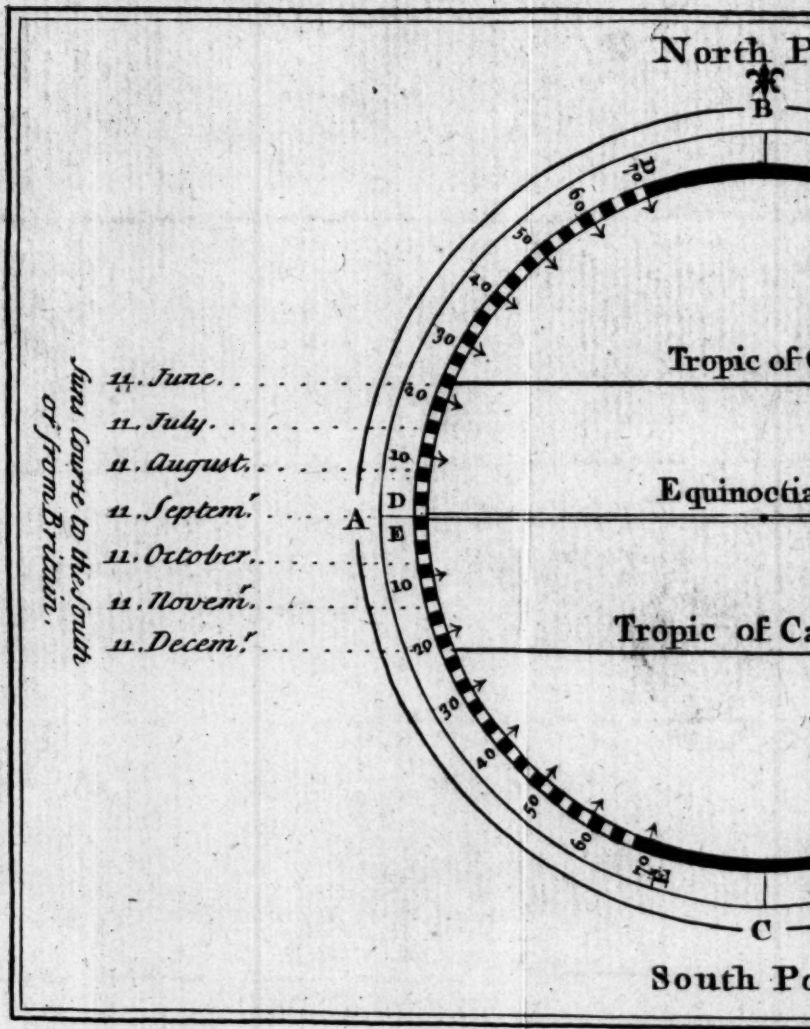
The Coffee-Tree, which grows naturally in the Kingdom of *Yaiman* in *Arabia Fœlix*, is found from the Latitude of 18 to 20 Degrees North; and the *Dutch* now have it growing at *Batavia*, 7 Deg. South Latitude, and at *Surinam*, 8 Deg. North. So I doubt not but in any of our Settlements between the Tropics, we might have Coffee in as great Perfection as in its

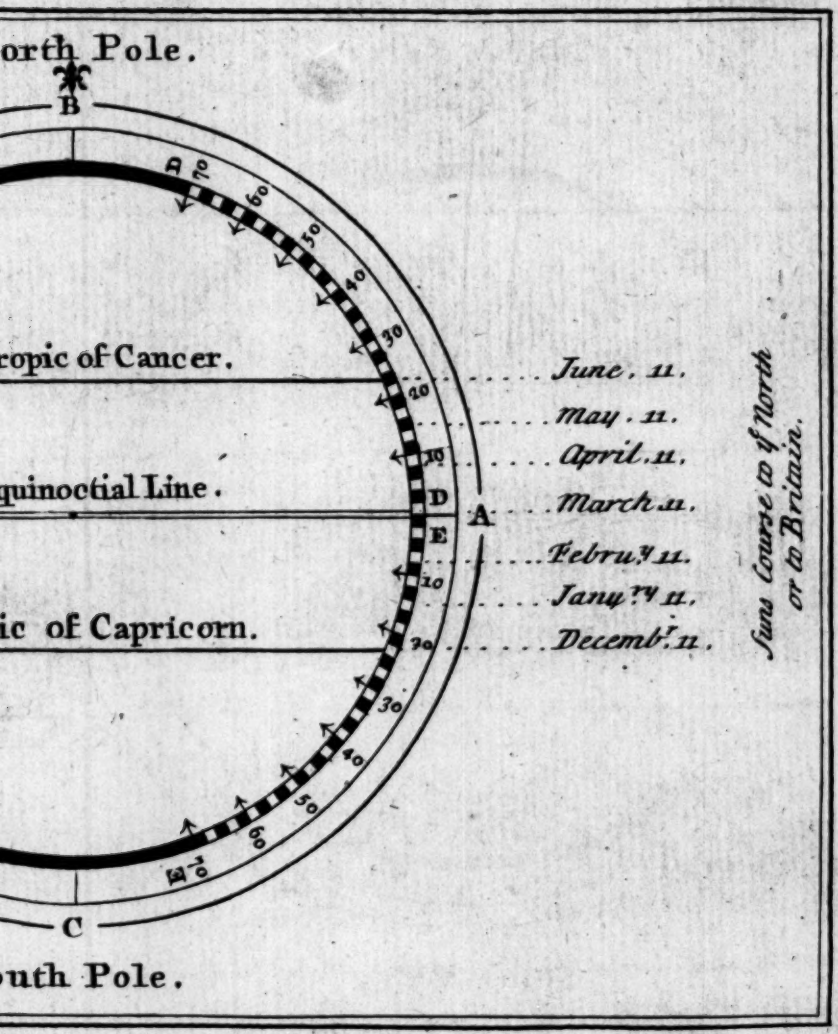
Native Country; and even towards the Southermoſt Parts of *Carolina*; for it is experienced in your Garden near *Croydon*, which is near the ſame Latitude with *London*, *viz.* 52 Deg. and ½ North Latitude, the ordinary Plants of Countries above 16 Degrees more Southward, thrive very well, without Shelter; ſo that I ſee no Room to doubt of the good Succeſs of the Coffee-Tree, if it is only mov'd 10 or 11 Degrees more North than its Native Place, eſpecially ſince both *Yaiman* and *Carolina* are North Latitude, and conſequently the Time of the Sun's Progreſs towards them is the ſame, tho' the Spring of the firſt is a little ſooner than the other; I yet am of Opinion, that the Places which lie without the Tropics only five or ſix Degrees, have always Warmth enough to keep Plants that grow naturally about five or ſix Degrees within the Tropics.

This being all I can remember of the Coffee-Tree, and its Culture in the Gardens at *Amſterdam*, I ſhall proceed to give you a Liſt of all the principal Places Names, from whence we may expect to receive Plants, and mark to each of them their Degree of Latitude, whether North or South, which I ſhall think very well worth my while to have put in the Order you will find it, if it may prove uſeful to you.

Alphabetical




North P
B
70
60
50
40
30
20
10
Tropic of
Equinoctia
Tropic of Ca
10
20
30
40
50
60
70
C
South Po
11. June
11. July
11. August
11. Septem.r
11. October
11. Novem.r
11. Decem.r
A
D
E
Suns Course to the South
or from Britain.


orth Pole.
B
A
10
60
50
40
30
20
10
D
A
E
10
20
30
40
50
60
70
C
ropic of Cancer.
quinoctial Line.
ic of Capricorn.
uth Pole.
June. 11.
May. 11.
April. 11.
March. 11.
Febru.y 11.
Janu.ry 11.
Decemb.r 11.
Suns Course to y North
or to Britain.

Alphabetical LIST of the Names of Places in the ſeveral Parts of the World, with their Degrees of Latitude, &c.

A

ACadia, from 49 to 45 North.
Azores Iſles, from 39 to 37 North.
Algiers, and the greateſt Part of *Barbary* Coaſt, from 37 to 35 North.
Alexandria, 31 North.
Aden, 12 North.
Amboina, 3 South.
Antegoa, 17 North.
Amazons Country, from 18 South to the Line.
Angola, 11 South.

B

Buenos Aires, 35 South.
Barbadoes Iſle, 13 North.
Brazil, from 35 South to the Line.
Bermudas, 33 North.
Bahama Iſles, from 28 to 22 North.
Bayador, 26 North.
Byſagos, 11 North.
Baudera Baſhee in the South of *Perſia*, 28 North.

Borneo Iſles, from 6 North to the Line, and two Degrees South.
Banda, the Nutmeg Iſland, 4 South.
Bencola, 4 South.
Batavia, 7 South.
Bombay, 19 North.
Bengale, 23 North.

C

Canada, from 50 to 38 North.
Carolina (*North*) from 36 to 33 North.
Carolina (*South*) from 33 to 30 North.
Calefornia, from 44 to 23 ½ North.
Cuba, from 22 to 19 North.
Caribbee Iſlands, from 20 to 10 North.
Cape Verd Iſlands, from 18 to 12 North.
Canary Iſlands, from 30 to 28 North.
Corſica, 42 North.
Candia, 35 North.
Cyprus, 35 North.
Cambaya, 23 North.
Cormandel, from 16 to 8 North.
Camboyda, 14 North.
Ceylan, from 10 to 6 North.
Conchinchina, from 20 to 10 North.
China, from 41 to 20 North.
Chuſan, 30 North.
Ceram Iſle, 3 South.
Curaſan Iſle, 12 North.
Carthagena, 11 North.
Cape Horn, 64 South.
Chiloa Iſles, 42 South.
Chili from 44 to 24 South.
Cape St. Auguſtin, 8 South.

Cape

Cape Frio, 23 South.
Cape of Good Hope, or *Cape Bona Eſperanza*, 34 South.
Cafres, 25 South.
Congo, 7 South.

F

Florida, from 38 to 24 North.
France, from 50 to 42 & ½ North.
Fort Ventura, 28 North.
Formoſa Iſle, from 25 to 22 North.
Fort St. David, 12 North.
Fort St. George, 13 North.
Ferdinand Iſles, 33 South.

G

Gibralter, 36 North.
Greece, from 41 to 36 North.
Guinea (*Upper*) from 18 North to the Line.
Gambia, 13 North.
Gold Coaſt in *Guinea*, 8 North.
Golconda, 18 North.
Gombroon, 27 North.
Guinea (*Lower*) from 17 South to 3 North.

H

Hiſpaniola, from 20 to 18 & ½ North.
Honduras Bay, from 20 to 17 North.
Hungary, from 50 to 46 North.
Horn Cape, 64 South.
Hottentots Country, from 34 to 30 South.

I

Jamaica, 18 North.
Italy, from 45 to 39 North.
Iſpahan in *Perſia*, 33 North.

Japon

Japon or *Japan Iſles*, from 40 to 20 North.
Java from 8 to 6 South.

L

Liſbon, 39 North.
Lima, 11 South.

M

Mona Iſle, famous for odd Plants, 15 Nor.
Molucca Iſles, from 10 South to 3 North.
Macaſcar, from 5 South to 1 North.
Madagaſcar, from 26 to 11 South.
Moſambique, 14 South.
Maryland, 39 North.
Mexico (*New*) from 38 to 28 North.
Mexico, from 28 to 16 North.
Madera Iſles, 32 North.
Minorca, 40 North.
Majorca, 40 North.
Morocco, 32 North.
Malaca, from 10 North to 1 South.
Mindanao, from 9 to 7 North.
Mogodor, 35 North.
Malabar, from 12 to 3 North.
Mindoro, 13 North.
Maldive Iſles, from 8 North to 3 South.
Madura Iſle, 7 South.
Montabay, 2 South.
Miſſiſippi River Mouth, 28 North.
Montſerat, 16 North.
Magellan, from 54 to 34 South.
Mataman, 18 South.
Monomotapa, 17 South.

N

Newfoundland, from 50 to 48 North.

New-

New-England, from 44 to 40 North.
New-York, from 41 to 40 North.
New-Spain, from 17 to 7 North.
Naples, 41 North.
Nankin, 32 North.
Nicobar Iſles, 9 North.
Nevis Iſle, 17 North.

O

Oroonoco River Mouth, 9 North.
Oporto, 41 ½ North.

P

Penſilvania, 40 North.
Portugal, from 42 to 37 North.
Pegu, 18 North.
Paragoa, 10 North.
Phillipine Iſles (*New*) from 11 North to the Line.
Phillipine Iſles, from 18 to 9 North.
Pekin, 40 North.
Porto Bello, 10 North.
Paraguai, from 37 to 18 South.
Peru, from 24 South to 1 North.
Porto Figuro, 16 South.

R

Rio de la Plata, 35 South.
Rio Geneiro, 23 South.

S

St. Helena, 15 ½ South.
St Sabaſtian, 22 South.
St. Salvador, 12 South.
St. Domingo, 33 South.
Surinam, 8 North.
Spain, from 43 to 36 North.

Sardinia

Sardinia, from 40 to 39 North.
Sicily, from 39 to 38 North.
Scanderone, 36 ½ North.
St. Thomas Iſle, under the Line.
Surat, 20 North.
Sumatra, under the Line.
Smyrna, 38 North.
Socotra Iſle, 13 North.
Soler Iſles, about 7 South.
Siam, 15 North.
St. Chriſtophers, 17 North.

T

Toulon, 43 North.
Tripoli, 32 North.
Turkey in *Europe*, from 48 to 41 North.
Ternate, the Iſland where the Clove-Trees grow, 2 North.
Timor Iſle, 9 South.
Trinidad Iſle, 10 North.
Terra del Fuogo, from 56 to 54 South.

V

Virginia, 37 North,
Vera Cruz, in *Campeche Bay*, 18 North.
Ventura Forte, 28 North.
Viſapour, 17 North.
Vera Cruz, in the *Amazons* Country, under the Line.

Y

Yaiman in *Arabia Felix*, the Coffee Country, 20 North.

Z

Zanguebar, from 16 South to the Line.

And

And now, Sir, that I have given you an Account of the Latitudes of Places, I think it may not be amiſs to ſend you likewiſe the following Memorandums, for the Uſe of your Gardeners, that they may better underſtand the Uſe of the foregoing Liſt of Names, by knowing at what Seaſons the Sun is neareſt to any particular Place, and in what Months fartheſt from it, that the Fires may be regulated accordingly. The Figure annex'd repreſents the Globe, with the Equinoctial Line, and the two Tropics; whereby they will find that the Extent of the Sun's Progreſs is 47 Degrees from the Tropic of *Cancer* to the Tropic of *Capricorn*; and that the Sun has its Courſe from Tropic to Tropic twice every Year: I think it proper, as I now talk to Gardeners, who perhaps have not had the Opportunity of any great Share of Learning, to treat them upon this Head in the moſt eaſy and familiar Way, and talk of the Sun's Motion backwards and forwards, which they generally believe, rather than to perplex them with ſpeaking of the Earth's Motion, which they, perhaps, cannot comprehend.

From A. A. to B. in the Figure, is North Latitude.

From A. A. to C. is South Latitude.

From D. to D. we ſhall find the Degrees of North Latitude mark'd 10, 20, 30, 40, 50,

50, which is near the Southermoſt Part of *England*, *London* is 52 & ½ Degrees.

From E. E. we find the Degrees of South Latitude mark'd 10, 20, 30, 40, *&c.*

Every Diviſion in that Circle of Degrees, whether it is mark'd Black or White, is two Degrees, or 120 Miles.

The Sun is upon the Line *March* 11, and alſo upon the ſame Line *September* 10; ſo that at either of thoſe Times the Sun's Influence is equal on both Sides the Line: All the South Latitudes have the ſame Share of it as the North Latitudes.

The Sun is at the Tropic of *Cancer*, *June* 11, which is the utmoſt Extent of its Courſe Northward: This Tropic is 23 Degrees and ½ North of the Line, which, reckoning 60 Miles to each Degree, is 1410 Miles between the Tropic and the Line, which is the Progreſs of the Sun in 13 Weeks, or a Quarter of a Year; ſo that in the Sun's Courſe from the Tropic of *Cancer* to the Line, it retreats 15 and ½ Miles every Day, or about 108 Miles *per* Week; which in a Month of 30 Days is 463 Miles or upwards, or above 7 Degrees and ½.

For the better Explaining of this, ſee the following Remarks.

June 11, the Sun in the Tropic of *Cancer*, or 23 Degrees and ½ North Latitude.

July about the 11th, the Sun about 16 Degrees North Latitude.

Auguſt

Auguſt about the ſame Day, about 8 Degrees North Latitude.

September about the 11th, upon the Line.

October about the ſame Day, about 8 Degrees South Latitude.

November about the ſame Day, near 16 Degrees South Latitude.

December about the ſame Time, the Sun in the Tropic of *Capricorn*, its fartheſt Bounds to the Southward.

January about the ſame Day, it has return'd or come nearer to us about 8 Degrees, and is then near 16 Degrees South Latitude.

February about the ſame Day, the Sun is about 8 Degrees South Latitude.

March about the ſame Day, the Sun is returned to the Line.

April about the ſame Day, the Sun is advanced to about 8 Degrees North Latitude.

May about the ſame Day, the Sun is advanced to about 16 Degrees North Latitude.

From this and the Figure, any one may eaſily find out in what Latitude the Sun is in every Month, and how it approaches or goes farther off the native Country of the Plants we deſign to cultivate; for Example, If we were to keep the Nutmeg-Tree, let us look for *Banda* in the foregoing Catalogue, and we ſhall find it in 4 Degrees South; then ſee in the Figure

the

the Months when the Sun is neareſt that Place, which we ſhall find *September* and *October*, and *January* and *February*; in theſe Months we muſt keep Fires in our Stoves, at leaſt up to the Pine-Apple Heat in Mr. *Fowler*'s Thermometers, which may be had at his Shop in *Swithin's-Alley* by the *Royal-Exchange*; and ſo indeed the Fires muſt be ſtill kept on from the firſt lighting in *September*, 'till we may place them in a Glaſs-Caſe in Tanners Bark, which may begin about the Middle of *April*, and laſt 'till the Time we begin to make Fires again in *September*; for we muſt conſider, that Places ſo near the Line are always very much under the Sun's Influence, tho' more at ſome Times than others: So when ſuch Plants are with us, we ſhould only give them Air directly from abroad in our hotteſt Days of Summer.

Suppoſe in the next Place, we were to propagate the Tea which grows in *China*; let us look for *China* in the foregoing Catalogue, and we ſhall find it extend from 41 to 20 North Latitude. I ſhall ſuppoſe that the Tea grows about the Middle of the Country, which is 30 Degrees North, or about the ſame Latitude with *South Carolina*; then as we have Plants from the South Parts of *Carolina*, which after a little Care to harden them, will ſtand abroad with us; I make no Doubt but the

China

China Tea, which appears to grow about 30 Degrees North, may be eaſily propagated with us; but eſpecially would proſper exceeding well, to be planted in *South Carolina*, from whence we might ſoon bring large Quantities, if it was once planted there, and make three or four Returns for one *China* Voyage: But as to the propagating of it in *England*, if we were to give it Shelter in the Winter, we may ſee by the Figure, that the Summers in *China* are only a little earlier than with us, and the Winters are of courſe much about the ſame Time; beſides, as 30 Degrees are out of the Tropics, there need not be any artificial Heat apply'd, nor any other Care taken to preſerve the Tea with us, but to give it ſome little Shelter in extreme Froſty Weather, and it is a Quere whether even that be neceſſary or not; for we muſt be careful not to give Heat to a Plant that does not require it: We have Experienced in the propagating of the Caper; we uſed to put it into our warmeſt Stoves, and took a great deal of Pains with it to no Purpoſe, 'till I ſow'd it in ſome old Walls, and gave it the free Air, and then it anſwer'd the End of bearing Flowers as well as it does at *Toulon*.

While I am ſpeaking of tranſplanting theſe Riches from one Place to another, I cannot help wondering that the Cochinele,

which is plainly an Inſect, is not induſtriouſly propagated in our *Weſt-Indian* Settlements; ſeeing it might be done only by tranſplanting one of the Sort of Opuntia's whereon this Inſect has laid its Eggs, that alone would ſoon fill a Country with it, as well as the Plant neceſſary for it to feed upon.

For a third Example, let us conſider *Barbadoes*, whoſe Latitude is 13 North, whether or not the Sun in its greateſt Diſtance from it, be more than the Sun is from *England* in the longeſt Day? We ſhall find by the Figure, that at the ſhorteſt Day with us, the Sun is diſtant from *Barbadoes* 36 and ½ Degrees; but in our longeſt Day the Sun is only diſtant from us 29 Degrees, which is 7 Degrees and ½ that the Sun is then nearer to us than it is to *Barbadoes* at our ſhorteſt Day; I have heard that the Nutmeg-Tree was once in *Barbadoes*, and proſper'd very well; and I ſee no Reaſon why we may not try it in that Iſland once more, or at leaſt the Cinnamon, which now grows in *Ceylon*, whoſe Latitude is from 10 to 6 North.

Conſidering the Latitude of *Jamaica*, which is 18 North, no Place could better fit the Coffee-Tree than this; ſo the moſt Southward of the Caribbee Iſlands would do very well for the Pepper, Clove-Trees, and any of the Spices, for the Nutmeg grows in 4 Degrees North, the Cloves

in

in the Iſland *Ternata* 2 Degrees North, the Pepper in *Borneo* 6 Degrees North, as well as under the Line, and the Cinnamon at *Ceylon* from 10 to 6 North; ſo I doubt not but they will all do well in the South of the Caribbee Iſles, which lie in 10 Degrees North, for even 10 Degrees difference between the Tropics, is of little Import to Plants which are Natives of the Torrid Zone.

There is one Example more I think neceſſary to offer, and that is, if we receive Plants from the *Cape of good Hope*, we ſhall, if we look into the Table, find its Latitude to be 34 Degrees South, then if we look into the Figure we may ſee that the Cape is near 11 Degrees beyond the Tropic of *Capricorn*, and we may ſuppoſe has much the ſame Influence of the Sun, when the Sun is in the Tropic of *Capricorn*, that *Gibraltar* has from the Sun when it is in the Tropic of *Cancer*: For *Gibraltar* is in 36 North, as the Cape is 34 South; their Winters and Summers are directly oppoſite, and that is chiefly what we have to regard in the Management of the Cape Plants, we muſt give them what Encouragement they have in the Months *November*, *December*, *January*, and *February*; for the Figure ſhews us the Sun is neareſt to the Cape in thoſe Months; and indeed the Plants themſelves ſhew it us in their Attempts of flow'ring at thoſe Seaſons:

But we muſt not ſuppoſe that all the Plants we receive from the Cape, are Natives of that Place; for there are many Sorts of Plants cultivated at the Cape, which are Plants of other Countries, ſo we muſt uſe ſome Caution in this Affair.

In the Figure we may obſerve, that in the Month of *May* the Sun is juſt as near us as it is in *July*, and in *April* as it is in *Auguſt*, in *March* as in *September*; and yet tho' the Sun is equidiſtant from us in *July* and *May*, we find that the Heat of *July* is far ſuperior to that of *May*, which I ſuppoſe happens becauſe the Sun has had more Time to warm the Earth on our Side, and conſequently the Body of Air; but I think I have ſaid enough upon this Head to render my Scheme intelligible, and ſhall only add, that it is my Wiſh, that every one who goes abroad to the Countries where thoſe extraordinary Plants are, which I have mention'd, would be induſtrious to bring them to us, that in due Time they may be render'd uſeful. I cannot ſuppoſe, indeed, that a Ship will put ſo far out of her Way, upon her Return from an Eaſtern Voyage, as to leave Plants at any of our Settlements in *America*; but let the Plants be brought to *England*, there to be kept 'till a proper Opportunity offers to ſend them to the Places deſign'd for 'em; the new Stoves that are lately built will preſerve them,

if

if ſuch Inſtructions as theſe be follow'd, let them come from what Latitude they will: Nor let any one deſpair of Succeſs, tho' they have not Stoves immediately of their own to put the Plants into, which they bring over, ſo long as there is ſuch a Garden as Mr. *Fairchild*'s at *Hoxton*, near *London*, where ſuch Things may be immediately taken care of, and manag'd with Skill.

I remain, Good Sir,

Your moſt Humble Servant,

Richard Bradley.

To Mr. Bradley.

SIR,

ACcording to your Deſire, I ſend you a Catalogue of ſuch curious Flowers as blow in my Garden from *July*, to compleat the Year.

I am,

Your Humble Servant,

Tho. Fairchild.

Stock Gilly-Flowers, double and ſingle, white and red, purple and white, Tree Scabius, Muſk Scabius, *Turky* Scabius, *Fairchild*'s Mule, Valerian white and red, ſix Sorts of Viola Tricolor, *Spaniſh* Broom, *Virginia* Martagon, two Sorts of Goat Rue, horned Poppy, *Spaniſh* Jeſſamine ſingle and double, *Brazil* Jeſſamine, *Indian* yellow Jeſſamine, *Arabian* Jeſſamine, Ilex-leav'd Jeſſamine, *Virginian* yellow Jeſſamine, Linconium, ſeveral Sorts of Ficoides, Aloes ſeveral Sorts, Corn Marigold white and yellow, two Sorts of Anemone Spermos, Amomum *Plinii*, white flower'd Nightſhade, double and ſingle Virgin's Bower, double and ſingle flower'd Myrtle, five Sorts of Sun-Flowers, four Sorts of Gnaphaliums, Holyoaks, four Sorts of Apocinums, Campanula two Sorts, Oleanders four Sorts, Thorn Daſie ſcarlet and blue, Cardinal Flowers, Orpine white and red, Fritilaria-craſſa two Sorts, Paſſion Flowers four Sorts, Colchicums ſeveral Sorts, Cyclamens two Sorts, Trumpet Flower, Sopewort, Leonorus two Sorts, Arbutus, *Guernſey* Lilly, Bella Donna, Starworts ſeveral Sorts, Geraniums ſeveral Sorts, Cotiledons ſeveral Sorts, Autumn Crocus, Autumn Daiſie, Tree Milkwort, Aloe-leav'd Aſphodel, true Saffron, Onion-leav'd Aſphodel, Viburnum, Golden Rods two Sorts, Shrub Mallows four Sorts, double Pinks ſeveral Sorts, Laurus Tinus, Tamariſk,

Tamariſk, Jalop, Moon Trefoil, Stacus two Sorts, Colutea, Roſes, Carnations ſeveral Sorts, yellow Colchicum, Candy-tuft Tree, Grounſel Tree, *Dutch* Honyſuckle, Barba Jovis, Tenerum Bæticum, Tradeſcants double Spiderwort, Coma Aurea two Sorts, Platanus-leav'd Chriſanthemum, *Roman* Wall-Flower, Antirrhinum, Roſe Campion ſingle and double, Throatwort double white and blue, Tree Love-Apple two Sorts, Sampiere, Polyanthus, Auricula's, the monthly Grape, ſeveral new Sorts of Annals.

The following Grapes ripen with me in *Auguſt* and *September*.

The Sweet-water Grape black and white, the Muſcadine white, the Royal Muſcadine, the black Muſcadine, the white Chaſſelaſs, the black Chaſſelaſs, the black Cluſter Grape, the black Curran Grape, the *Zant* Curran, the *Narbois*, *Chianti*, the *Burgundy*, the Mælier, the Munier, the black *Morillion*, white *Morillion*, the white *Malvoiſie*, black *Malvoiſie*, variegated Grape, Parſley Grape, *Bourdeaux* Claret Grape, white *Frontigniac*, blue *Frontigniac*, red *Frontigniac*, grizle *Frontigniac*, *Muſcadelle*, *Greek* Grape, Fox Grape, St. *Peter*'s Grape, *Heſperion*, white Raiſin, red Raiſin, blue Raiſin, *Bourlac*, *Lombardie*, red *Hamborow*, blue *Hamborow*, white Grizleine, Matchleſs Grape.

Curious Flowers in October.

Aſh-colour and white Tree Scabius, Horn'd Poppy, double Stock Gillyflowers, *Spaniſh* Jeſſamin double and ſingle, *Brazil* Jeſſamine, *Arabian* Jeſſamine, Nettle-leav'd Jeſſamine, yellow *Indian* Jeſſamine, ſeveral Sorts of Ficoides, Onion-leav'd Aſphodel, Aloe-leav'd Aſphodel, two Sorts of Anemone Spermos, Tree Chriſanthemum, Myrtles, ſeveral Sorts, ten Sorts of Colchicums, four Sorts of Cyclamens, two Sorts of Leonurus, true Saffron, Arbutus, Guernſey Lilly, Bella Donna, Autumn Crocus, Tree Milkwort, ſcarlet flow'ring Geranium, with ſeveral other Sorts, Chriſanthemum Tree from *Carolina*, Mr. *Cateſby*'s new *Virginian* Starwort, Pelitory of *Spain*, ſcarlet flow'ring Viaburnum, black flow'ring Lotus, Coma Aurea, Tree Lychnes, purple flow'ring everlaſting Kidney-Bean, old Man's Head Pinks, new Sort of Barba Jovis, Limonium, Laurus-tinus ſeveral Sorts, Colutea, Aizoid Tythimals, Roſes, Moon-trefoile, ſcarlet flow'ring Cotildon, Paſſion Flower, Carnations, Fenel-leav'd Tree Scabius.

Curious Flowers in November.

Spaniſh Jeſſamine double and ſingle, yellow *Indian* Jeſſamine, *Azores* Jeſſamine, double

double Stock Gilliflowers of ſeveral Colours, Nettle-leav'd Jeſſamine, Aloes of ſeveral Sorts, Ficoides of ſeveral Sorts, Sedums of ſeveral Sorts, Aloe-leav'd Aſphodil, Onion-leav'd Aſphodil, Chriſanthemum Creticum white and yellow, Leonurus two Sorts, ſcarlet flower'd Geranium, with ſeveral other Sorts, *Venetian* Vetch, Mr. *Cateſby*'s fine blue Starwort, Colutea, Tree Milkwort, Coma Aurea, everlaſting Kidney-Bean, black flow'ring Lotus, Pelitory of *Spain*, Scabius of ſeveral Sorts, Paſſion Tree in Fruit, Carnations, Senſitive Plant in Flower, Polyanthus.

Curious Flowers in December.

Double Stock Gilliflowers of various Kinds, Senſitive Plants in Flower, Carnations, Tulips, Polianthus, Hyacinths, *Spaniſh* Jeſſamine, *Indian* Jeſſamine, Cyclamens, *Azores* Jeſſamine, Nettle-leav'd Jeſſamine, Geraniums ſeveral Sorts, Ficoides of ſeveral Sorts, Aloes of ſeveral Sorts, new Sort of Barba Jovis, old Man's Head Pink, *Venetian* Vetch, ſweet ſcented Cyclamen, Laurus-tinus ſeveral Sorts, Candy-tuft Tree, Mr. *Cateſby*'s fine blue Starwort, *Glaſtonbury* Thorn.

Curious

Curious Flowers in January.

Black Helebore with white Flowers, Helebore with green Flowers, Winter Aconite, Mezereon, Snow Drops double and ſingle, Candy-tuft Tree, Laurus-tinus ſeveral Sorts, blue Star Hyacinth, Paſſetout, Spring Cyclamen, ſweet ſcented Cyclamen, Canary Campanula, Polyanthus, Wall Flowers, Tulips, Anemonies, *Glaſtenbury* Thorn, new Sort of Barba Jovis, *Venetian* Vetch, Auricula's, Carnations, Kidney-Bean Tree.

Curious Flowers in February.

Spurge Laurel, Mezereon, Snow Drops double and ſingle, double Stocks of ſeveral Colours, black Helebore with a white Flower, Helebore with a green Flower, Tulips, Hyacinths, Radix Cava, double and ſingle white and yellow Wall-Flowers, Polyanthus, Miſleto, Canary Campanula, Spring Colchicum, ſweet ſcented and Spring Cyclamens, Narciſſus of *Conſtantinople*, Narciſſus of *Naples*, Winter Aconite, 20 Sorts of Crocus, Collection of Hyacinths, Auricula's, Polyanthus, Carnations, white and red Mezereons, *Perſian* Iris, double Primroſe, *Venetian* Vetch, Cornelian Cherry, Dens Caninus, *Yorkſhire* Sedum, Muſcary Hyacinth Aſh Colour

lour and white, Periwinkle white and blue, forty Sorts of Naciſſus, Hepaticas, Dwarf Almond, Fritilaries, Oranges, Anana's or Pine-Apple Fruit begins to appear.

Curious Flowers in March.

Stock Gilliflowers double of ſeveral Kinds, Wall-Flowers double white and red, 30 Sorts of early Tulips, Laurustinus, Oranges, Candy-tuft Tree, *Yorkſhire* Sedum, black Helebore with a white Flower, black Helebore with a green Flower, Polyanthus, double Primroſes, 20 Sorts of Crocus, ſingle white Hepatica, double and ſingle blue and Peach-colour Hepatica, Hyacinths, Spring Colchicum, four Sorts of Spring Cyclamen, four Sorts of Narciſſus, Cornelian Cherry, Star of *Naples*, Ranunculus, Dens caninus, Fumetory, Violets ſingle and double white and blue, Fenel-leav'd Helebore, Radix cava, Periwinkle white and blue and double purple, Dwarf *Hungary* Honyſuckle, Aſſarabacca of *Virginia*, Petaſites, Male Mandrake, Dwarf Medlar, Dwarf Flag Iris, *Venetian* Vetch, Nettle-leav'd Jeſſamine, 30 Sorts of Fritilaries, Dwarf Almond, Fruit bearing Almond, Simblaria, Miſleto, bulboſe Iris, double bloſſom Peach, Anemonies, monthly Roſe, Jonquils, double bloſſom Pear, double bloſſom Cherry, double bloſſom Almond, Arbor Judæ, with

with ſeveral other Sorts of Plants, whoſe Time of flow'ring is uncertain.

Of propagating the Lemon and Orange Tree by Layers, and of a new Hot Bed, &c.

To Mr. Bradley.

SIR, Oporto, October 22, 1723.

I Return you many Thanks for your acceptable Letter of *Auguſt* 17, O. S. with your farther Directions in the Culture of the Pine-apple, which as near as poſſible I ſhall obſerve; of three Thermometers ſent me over, two have been unfortunately broke in the Voyage; that which eſcaped was what you had marked the Heighth of the Spirit, *London May* 2; I have made diverſe Obſervations thereby, ſometimes I had in the Morning near 15 Degrees leſs Heat than at Noon, and the hotteſt Days this Year, at Noon, the Spirits 'roſe to the very Top of the Tube, that it was impoſſible to make any Obſervations. I placed another Thermometer by yours, which came from *Holland*, and had the Degrees mark'd on it; and tho' it was fixed

fixed in a good Dial-Board a quarter of an Inch deep, yet I found likewiſe, that the Sun had too great an Influence on the Spirit, and made it riſe too high; that I am of Opinion, ſeeing thoſe Thermometers require to be hung out in the Air, the Tube of them ſhould be ſo fix'd, to hinder the Power of the Sun, elſe there will be no Rule. Our Summer this Year has been exceſſive hot; thoſe that have liv'd in *Brazil*, confeſs we have had for ſome Days as warm Weather here as they: Our Summer Seaſon has laſted longer than uſual this Year, there having fallen no Rain 'till to-day of ſeveral Months; but however, the Weather with it continues ſo warm, that the Thermometer remains at 35 Deg. and I am of Opinion the coldeſt Seaſon here, when we have ſmall Froſts, is never more than 50 Deg. but of this I ſhall be a better Judge, by the Obſervations during the Winter Seaſon.

In the Management of the Pine-Apple this Year, I have been oblig'd, in the greateſt Heats entirely to unſhelter the Plants, elſe the Sun would have ſcorched them up: One of them this Summer was very ſickly, and had like to have dy'd; but about two Months ago I took the Plant out of the Pot, and planted in the Earth, which was heated at the Bottom with a little freſh Horſe-dung, which has recover'd it; the other has ſhot very vigorouſly,

ly, and I doubt not but, with Care, to ſee Fruit from it the next Year. I thank you for your Advice, concerning the Uſe of dry'd Sea-Sand. I am now about making my Winter Frame for the Anana's, and deſign to compoſe it as follows: To make it four Foot deep, the firſt two Foot to be the hotteſt Dung well ramm'd in, upon that a Foot and ½ of Sea-Sand dry'd and heated as you order, and the upper ſix Inches, in which the Pots are fix'd, of dry Cork Duſt when it is burnt, which is of a very hot Nature. The Tanners in this Country make uſe of the Bark of the Cork Tree in their Buſineſs, which is what Bark remains to the Tree after the Cork is taken off; but there are ſo few of them, that it is difficult to get enough; however, I ſhall make a ſmall Experiment of it as to Heat. The Anana's laſt Year thriv'd well enough in a Hot-bed only, during the Winter. We want thoſe Things you can eaſily procure; but however, Nature in ſome Meaſure ſupplies it thro' the Goodneſs of the Climate. I am glad you deſign to try the laying of Orange-Trees in the Ground, I'm aſſur'd it will ſucceed; our Way of increaſing Lemon or Orange Trees is by earthing up a Branch, and peeling off a little of the Bark of that Part of the Branch which is in the Earth, to make it ſtrike Root the ſooner; by thoſe Means, when it has got Root, the Branch which is removed, makes

a good

a good new Tree, altho' it has Bloſſoms, and green and ripe Fruit upon it, for the Lemon-Tree bloſſoms and bears all the Year throughout. The Way of budding and graffing thoſe Trees on wild Stocks is found here too tedious. As Lemons of late Years here have bore a great Price, it has induced the Owners to endeavour to propagate and increaſe that Fruit as much as poſſible. The largeſt and faireſt Fruit of that Sort, is graffed on a Citron Stock.

I am truly, Sir,

Your Obliged Humble Servant,

John Clarke, *jun.*

The foregoing Letter furniſhes us with ſuch Obſervations as my reader could not excuſe my paſſing by, in a Work of this Nature, which aims at the Good as well as the Amuſement of the Curious; and though the laying of Orange and Lemon Trees is in this firſt publiſh'd, yet conſidering the Reaſon of the Thing, I wonder it has not been practis'd generally before this Time; for almoſt every one knows, that laying a Branch of a Tree in the Ground, will occcaſion it to ſtrike Root; and then, why ſhould the Orange and Lemon Trees be alone neglected; for had it been try'd, I am convinc'd it would have been

been ſucceſsful, not only from the Aſſurance given by the curious Gentleman who gives us this Letter, but from the Experience of *William Thornton*, Eſq; at *Bloxham* in *Lincolnſhire*, in whoſe Gardens, among many other fine Experiments of his, I found this Method uſed ſucceſsfully, but this Gentleman abounds ſo much in Rarities of this Kind, as well as new Improvements in Huſbandry, that to mention them as they ſhould be, would almoſt make a Volume of themſelves; and had it been my Fortune to have known the Maſter of ſo happy a Genius, I doubt not but to have found as much Improvement from his Converſation; for *Opus Artificem probat*; but this *en Paſſant*.

I come now to conclude my monthly Papers, and take the Opportunity of thanking thoſe curious Gentlemen who have been aſſiſting to me in the Work; and I cannot help expreſſing the Pleaſure it has given me, to find many of the Rules I have laid down, put in Practice; and eſpecially to obſerve how much Men of the greateſt Learning have fallen into the Way of Gardening and Planting, ſince I began to write upon the Subject. The World, I hope, will excuſe me if I boaſt a little of my Succeſs in this Way, ſince ſome Complements upon it, have been the chief Reward I have met with, for all my great Expence and Labour; however, as

I can

I can never abandon the Study of Planting and Gardening, as Things that contribute to every Man's private Good, as well as the good of my Country; ſo whatever curious Diſcoveries in that Way may be communicated to me, will be very acceptable.

This Piece, with the four preceding Monthly Remarks, compleats a Volume, which will be the Third and Laſt of my Monthly Writings.


BRITISH MUSEUM
15
60
JUN

INDEX

TO THE

THIRD VOLUME.

N. B. In this INDEX, the Letter A. refers to the Pages in the Months *April* and *May*: The Letter J. refers to the Pages in the Months *June* and *July*: And the Letters Au. refer to the Pages in the laſt Monthly Obſervations.

INDEX.

Hot-

Mango,

Sallads

FINIS.

The Reader is deſir'd to amend the Errors of the Preſs, which may have eſcap'd Correction, by Reaſon of the Author's Reſidence in the Country.

INDEX.

FINIS.

The Reader is desir'd to amend the Errors of the Press, which may have escap'd Correction, by Reason of the Author's Residence in the Country.